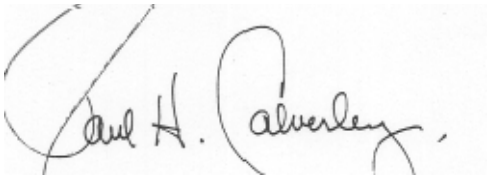
Foreword

This soil survey contains information that can be used in land-planning programs in the survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.



Paul H. Calverley
State Conservationist
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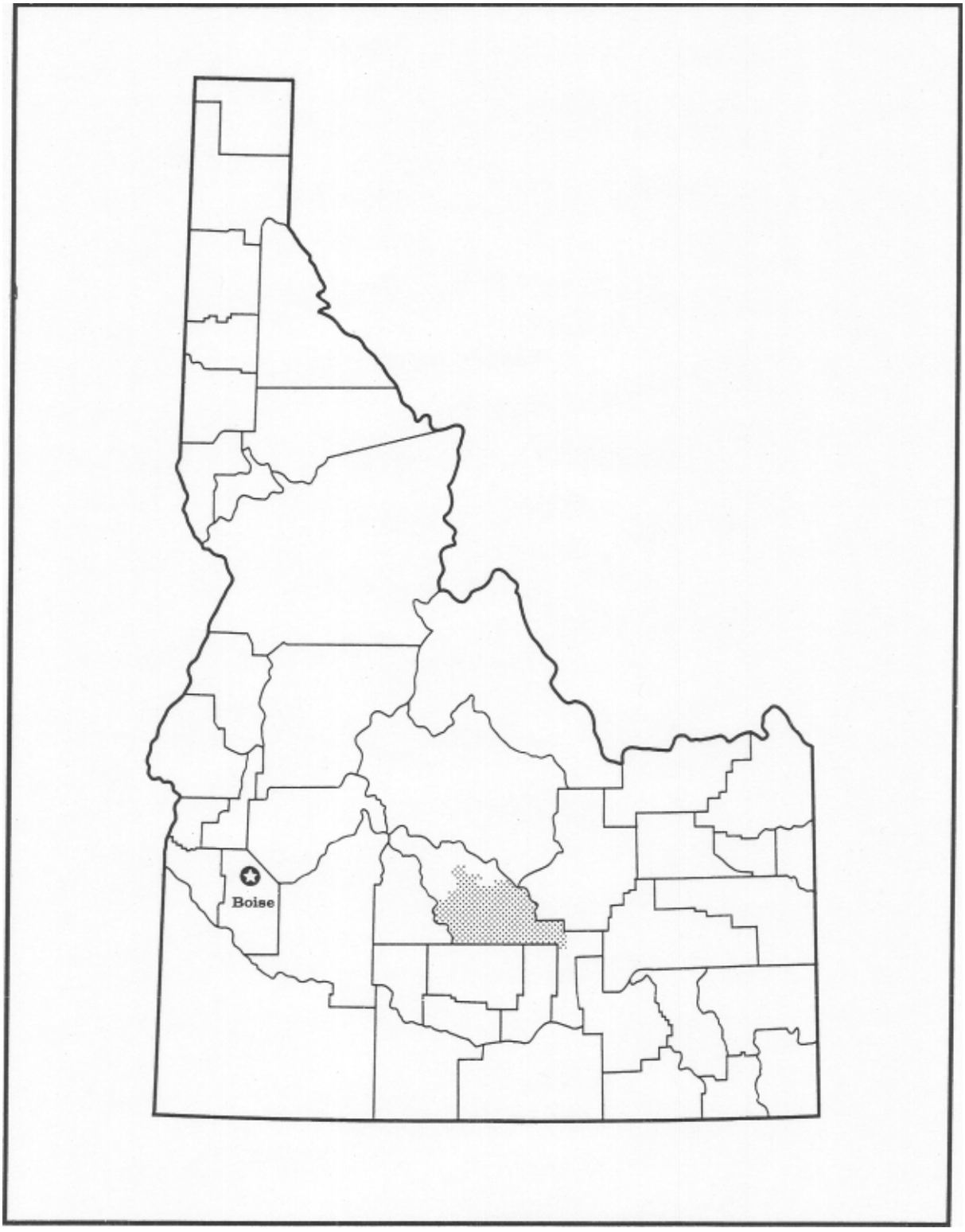

Location of the Blaine County area in Idaho.

Soil Survey of
Blaine County Area, Idaho

By Mark E. Johnson, Soil Conservation Service

Fieldwork by Mark E. Johnson, William D. Harrison, Peter F. Biggam, Jr.,
Glenn A. Hoffman, and Karen R. Langersmith, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in
cooperation with
United States Department of the Interior, Bureau of Land Management; University of Idaho,
College of Agriculture; and Idaho Soil Conservation Commission

BLAINE COUNTY AREA is in the south-central part of Idaho. It includes all of Blaine County, except for an area in the southern part adjacent to Lincoln and Minidoka Counties extending to the Snake River and an area in the extreme northern part, in the Salmon River drainageway. Also excluded is land administered by the Forest Service. The survey area includes private land and land that is administered by the state and by the Bureau of Land Management. The total area is about 807,529 acres, or 1,262 square miles. The population of Hailey, the county seat of Blaine County, was 2,109 in 1980.

The northern part of the survey area consists of steep, rugged mountains. The Big Wood River, the Little Wood River, and Fish Creek flow in a southerly direction from the mountains. Silver Creek originates south of Bellevue. The southern and eastern parts of the survey area consist of lava flows, which extend from the Craters of the Moon area to the southern boundary of the survey area.

The lowest point in the survey area, about 4,600 feet in elevation, is the area where the Big Wood River crosses the boundary line between Blaine and Lincoln Counties. Hailey, located in the center of Wood River Valley, is at an elevation of about 5,329 feet, and Sun Valley, in the northern part of Wood River Valley, is at about 5,960 feet. Blizzard Mountain, the highest point in the survey area, has an elevation of 9,250 feet. It is in the mountainous northeastern area.

Two older unpublished surveys, "Wood River Soil Survey," completed in 1974 (20), and "Soil Survey of Blaine Soil Conservation District," completed in 1961 (19), cover most of the present survey. The present survey, however, updates the earlier surveys and provides additional information.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or the extent of the soils in the survey areas.

General Nature of the Survey Area

This section gives general information about the survey area. It describes history and development, natural resources, farming, and climate.

History and Development

In 1824, Alexander Ross led an expedition into the Blaine County region. The first permanent settlers in the Wood River Valley arrived in 1879. They mined galena, which is a combination of silver, zinc, and lead. Some gold was also mined.

Alturas County, which was later renamed Logan

County and then Alta County, was established on February 4, 1864. Part of this county became Blaine County on March 5, 1895, and Hailey became the county seat. Other communities in the county are Ketchum, Sun Valley, Carey, Picabo, Bellevue, and Gannett.

Mining influenced the establishment of mail and freight routes in Blaine County. In 1883, the first railroad line in the area was established. The mining boom was over by the early 1900's, and the amount of mining done became dependent on fluctuating mineral prices.

In 1935, the Union Pacific Railroad hired an Austrian alpine ski expert to locate a site for a ski resort that would attract tourists to travel to the west on the company's streamlined trains. In January 1936, a 3,400-acre ranch just 1 mile east of Ketchum became the Sun Valley ski area. In 1939, the Union Pacific Railroad leased Bald Mountain from the Forest Service, and the first chair lift was installed on the mountain the following summer.

The first farming community in the area was established along Spring Creek near Carey in 1879. The population of the early farming communities fluctuated with the boom and decline of the mining industry. Also contributing to the instability of the agricultural communities was the cool climate, which limited the number of suitable crops.

Natural Resources

Soil and water are the most important natural resources in the survey area. Livestock, crops, and timber are marketable products that are dependent on these resources. Only a small acreage of timber, which is on federally administered land, is harvested and marketed in the area.

The survey area has abundant water resources. The deep snowpack and large amount of precipitation received in the high mountains are the main sources of water for the Big Wood River, the Little Wood River, and Fish Creek. Silver Creek, a major tributary of the Little Wood River, gets its water from springs and from the high water table that is a result of irrigation in the higher areas.

Water for irrigation comes from many sources, including the Big Wood River, the Little Wood River, Fish Creek, Silver Creek, and wells. The distribution of irrigation water from the Big Wood River and Silver Creek to individual farms is handled by irrigation districts and cooperative ditch groups. The Little Wood River drainageway in Carey Valley provides water for a 312-square-mile area. Water from the Little Wood Reservoir, which was enlarged in 1955 to its present capacity of 30,000 acre-feet, irrigates about 12,000 acres. Fish Creek Reservoir, which was built in 1917, has a capacity of 14,000 acre-feet, and water from it irrigates about 6,000 acres. Ground-water wells are used to irrigate most of the rest of the agricultural acreage in the survey area. Water from artesian wells is used to irrigate crops near the community of Picabo.

Most of the mining done in the area is for sand and gravel, which are plentiful along the Big Wood and Little Wood Rivers. A few metallic ore mines are in operation, but work is restricted to exploration.

Farming

In 1980, about 79,000 acres of cultivated land was in the survey area, most of which was used for alfalfa, barley, wheat, oats, or pasture. Irrigation is needed for maximum production of all crops; however, some dryland wheat and barley is grown in the western part of the survey area. Areas of wet soils scattered throughout the area support wet meadow hay and pasture. Malting barley is a specialty crop grown in the survey area.

Grazing by sheep and cattle is important to the economy of the survey area. Cow-calf operations are dominant.

There are about 220 farms in the survey area. The average farm size in 1978 was 1,415 acres, of which about 270 acres was used as cropland.

The Blaine Soil Conservation District was established on January 29, 1954. Originally the district included only the Gannett, Picabo, Carey, Fish Creek, and Little Wood River areas, but on May 22, 1958, it was expanded to include the rest of Blaine County.

Climate

Prepared by the National Climatic Data Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Hailey and Picabo in the period 1951 to 1981. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 22 degrees F at Hailey and 21 degrees at Picabo and the average daily minimum temperature is 11 degrees at Hailey and 10 degrees at Picabo. The lowest temperature on record, which occurred at Picabo on January 24, 1962, is -33 degrees. In summer, the average temperature is 64 degrees at both Hailey and Picabo and the average

daily maximum temperature is about 81 degrees. The highest recorded temperature, which occurred at Picabo on July 21, 1960, is 101 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 17 inches at Hailey and 13 inches at Picabo. Of this, about 40 percent usually falls in April through September. The heaviest 1-day rainfall during the period of record was 2.68 inches at Hailey on December 22, 1964. Thunderstorms occur on about 15 days each year.

The average seasonal snowfall is 86 inches at Hailey and 47 inches at Picabo. The greatest snow depth at any one time during the period of record was 54 inches at Hailey. On an average, at least 1 inch of snow is on the ground 86 days of the year at Hailey and 64 days at Picabo. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 50 percent. Humidity is higher at night, and the average at dawn is about 70 percent. The sun shines 80 percent of the time possible in summer and 40 percent in winter. The prevailing wind is from the southeast. Average windspeed is highest, 11 miles per hour, in spring.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils and miscellaneous areas were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soilvegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are

developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

Special remote sensing techniques were used in this survey to aid in determining the composition and location of map units. Satellite imagery and large-scale aerial photographs were used to help soil scientists identify and quantify soils in remote and inaccessible areas.

Computer-generated maps were developed from satellite multispectral scanner imagery of the southeastern part of the survey area. The special symbols, or "pixels," on the maps portray various soil-vegetation-landscape characteristics important in the survey area. These maps combined with the field maps were used to help identify map units in remote areas (3).

Aerial observations were also conducted to determine the composition of map units affected by soil wetness. Computerized scanning of aerial photographs was used to determine the percentage of wet areas within specific map units. Digital maps depicting significant tonal changes due to wetness were used to help determine the composition of map units in areas that were not easily accessible (4, 7).

Helicopters were also used to observe some areas that were otherwise inaccessible.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each unit on this map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The soils or miscellaneous areas making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general map units in this survey have been

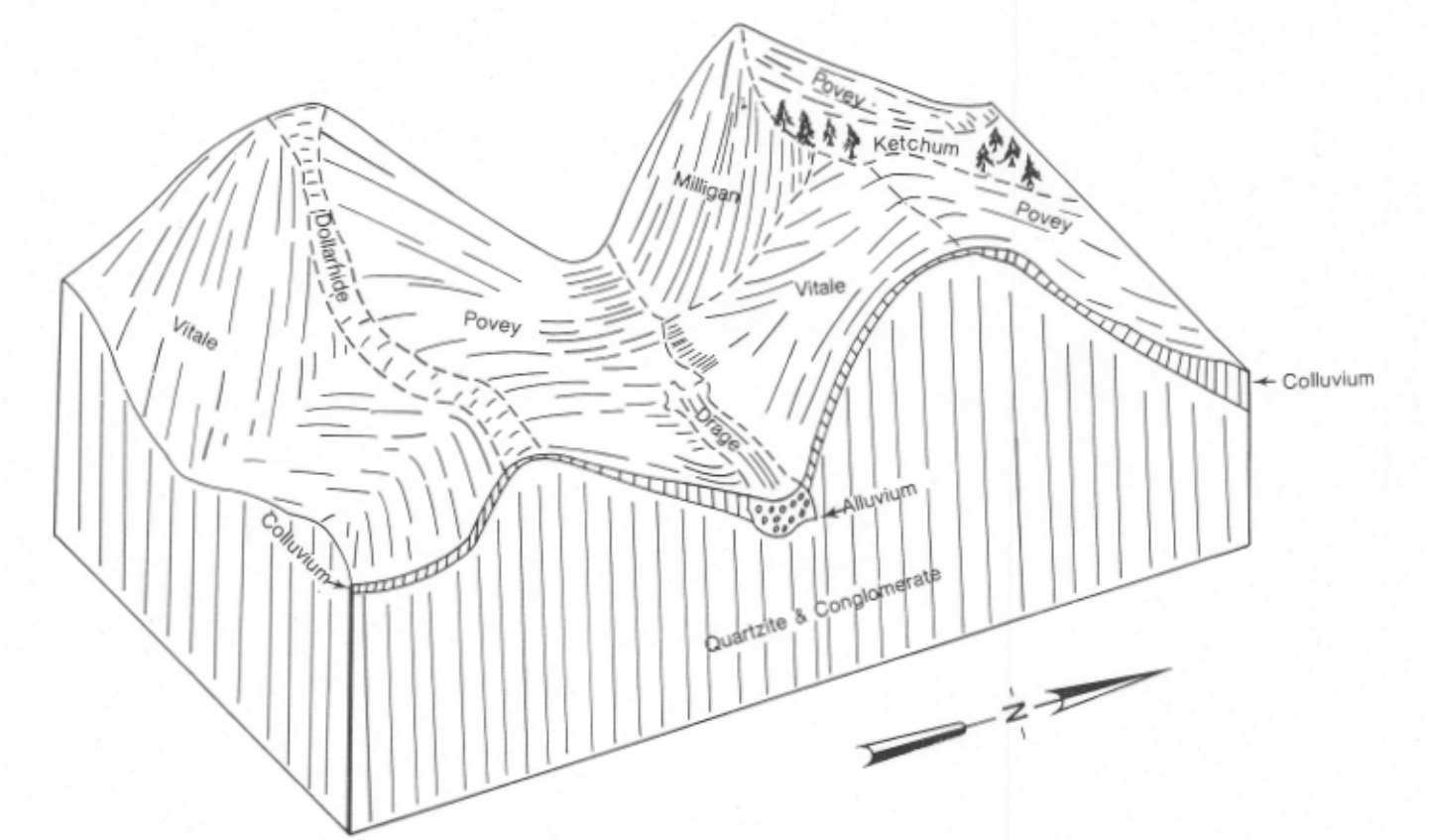

Figure 1.—Typical pattern of soils and underlying material in general soil map unit 1.

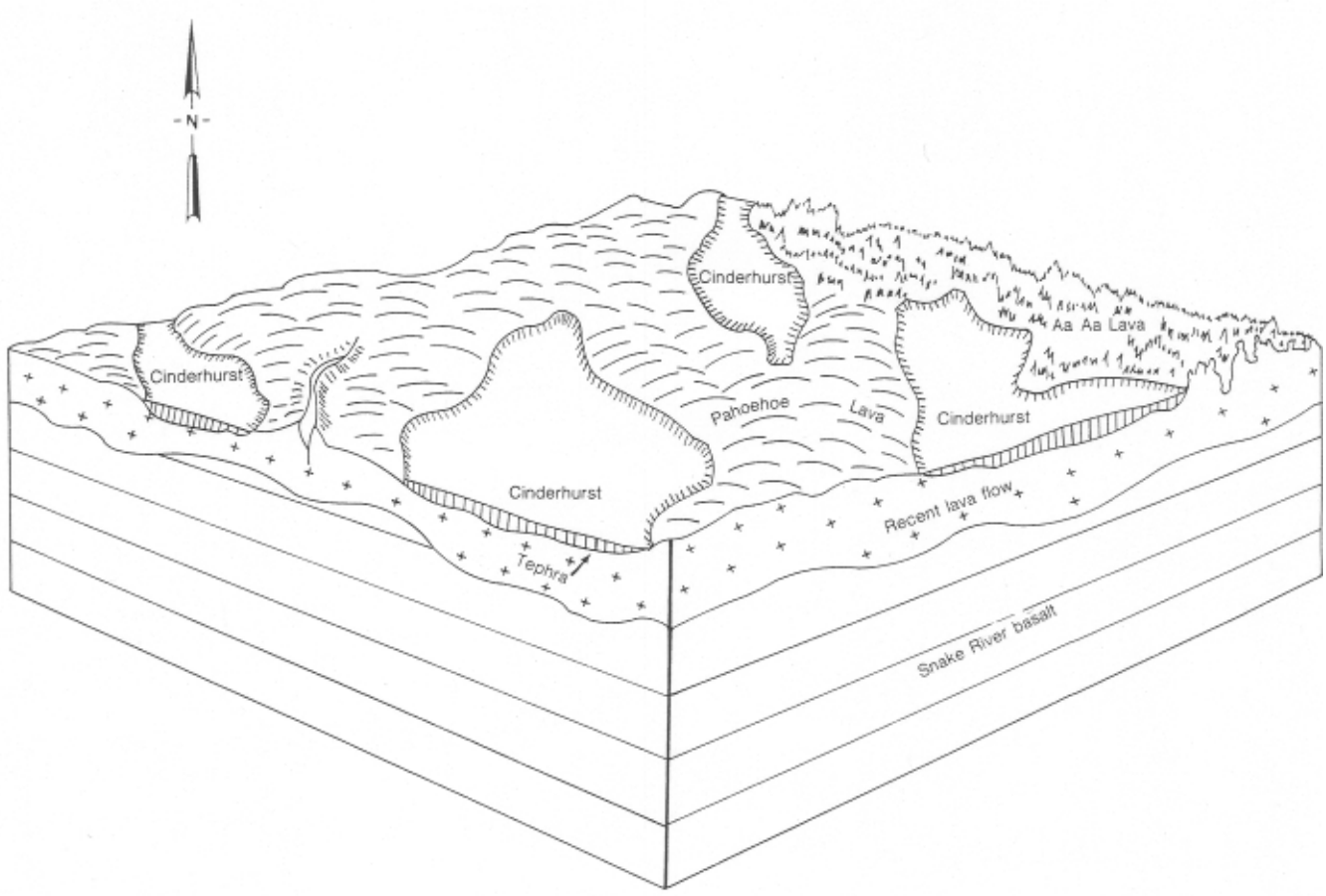

Figure 2.—Typical pattern of Lava flows, soils, and underlying material in general soil map unit 6.

grouped into general kinds of landscape for broad interpretive purposes. Each of the broad groups and the map units in each group are described in the following pages.

Map Unit Descriptions

Well Drained Soils on Mountainsides and Foothills
Number of map units: 5
Percentage of survey area: 58

1. Povey-Vitale-Milligan

Moderately deep and deep soils that formed in colluvium derived from metasedimentary rock (fig. 1); on slopes of *15* to 75 percent

Percentage of survey area: 22
Landscape position: Povey soils-north- and east-facing mountainsides; Vitale and Milligan soils-south- and west-facing mountainsides
Elevation: 5,000 to 9,250 feet
Frost-free period: 30 to 90 days
Average annual precipitation: 12 to 24 inches
Minor components: Drage, Dollarhide, and Ketchum soils; Rock outcrop; Rubbleland; Blackspot and Prudy soils
Major uses: Rangeland, wildlife habitat

2. Friedman-Elksel-Starhope

Moderately deep and deep soils that formed in colluvium and residuum derived from volcanic rock; on slopes of 4 to 60 percent

Percentage of survey area: 19
Landscape position: Friedman soils-north- and east-facing mountainsides; Elksel and Starhope soils-

south- and west-facing mountainsides and foothills
Elevation: 4,700 to 8,000 feet
Frost-free period: 30 to 90 days
Average annual precipitation: 12 to 22 inches
Minor components: Smelter and Winridge soils; Rock outcrop; Furshur, Peevywell, Molyneux, and Justesen soils
Major uses: Rangeland, wildlife habitat

3. Moonstone-Earcree

Moderately deep and very deep soils that formed in colluvium, alluvium, and residuum derived from granite; on slopes of 8 to 60 percent

Percentage of survey area: 6
Landscape position: Moonstone soils-south- and west facing mountainsides and foothills; Earcree soils north- and east-facing mountainsides and foothills
Elevation. 4,800 to 8,200 feet
Frost-free period: 30 to 90 days
Average annual precipitation: 12 to 22 inches
Minor components: Lockman, Bauscher, and Marshdale soils
Major uses: Rangeland, wildlife habitat 4.

4. Vitale-Lavacreek-Blackspar

Shallow to deep soils that formed in colluvium and in tephra over colluvium; on slopes of 15 to 75 percent

Percentage of survey area: 6
Landscape position: Vitale and Blackspar soils-south and west-facing mountainsides; Lavacreek soils north- and east-facing mountainsides
Elevation: 5,000 to 9,250 feet
Frost-free period: 30 to 90 days
Average annual precipitation: 12 to 24 inches
Minor components: Rock outcrop, Rubbleland, Dollarhide soils
Major uses: Rangeland, wildlife habitat

5. Elkcreek-Gaib-Winu

Shallow and moderately deep soils that formed in colluvium and residuum derived from volcanic rock; on slopes of 4 to 60 percent

Percentage of survey area: 5
Landscape position: Elkcreek and Gaib soils-south-

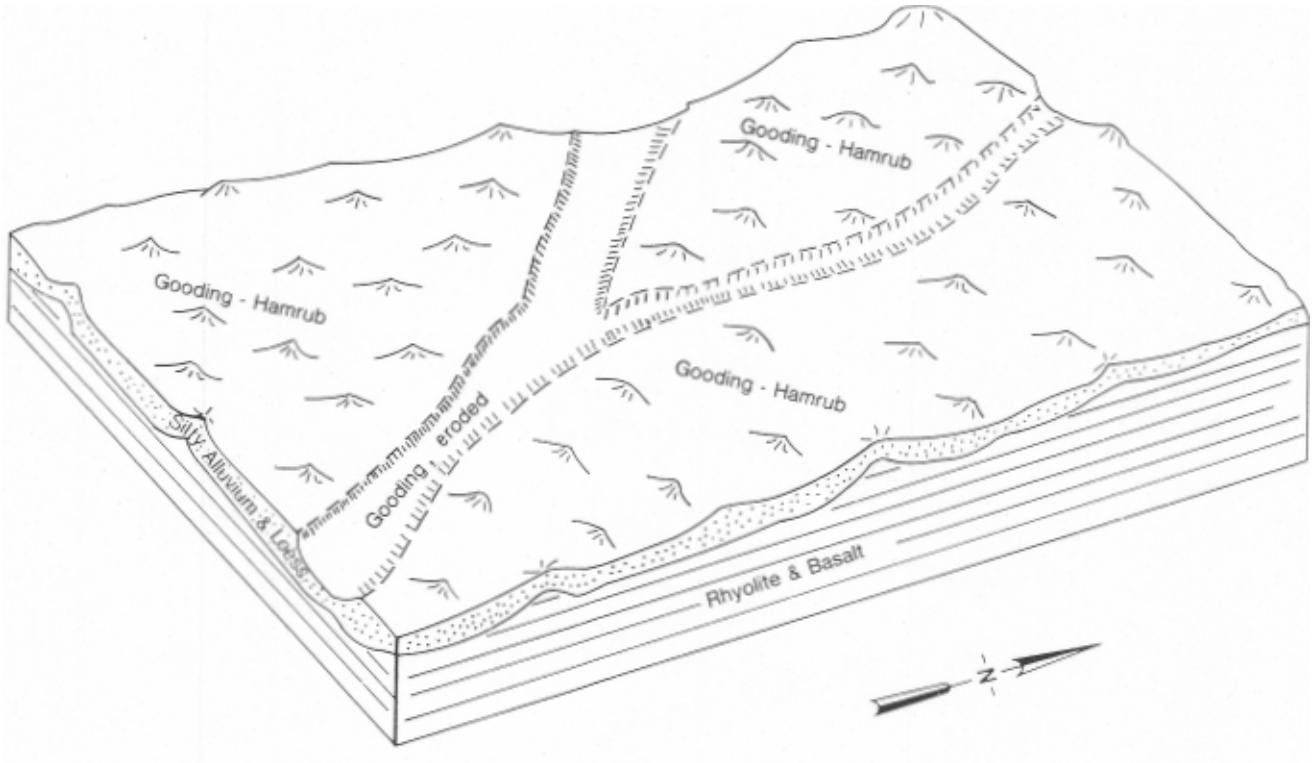

Figure 3.—Typical pattern of soils and underlying material in general soil map unit 8.

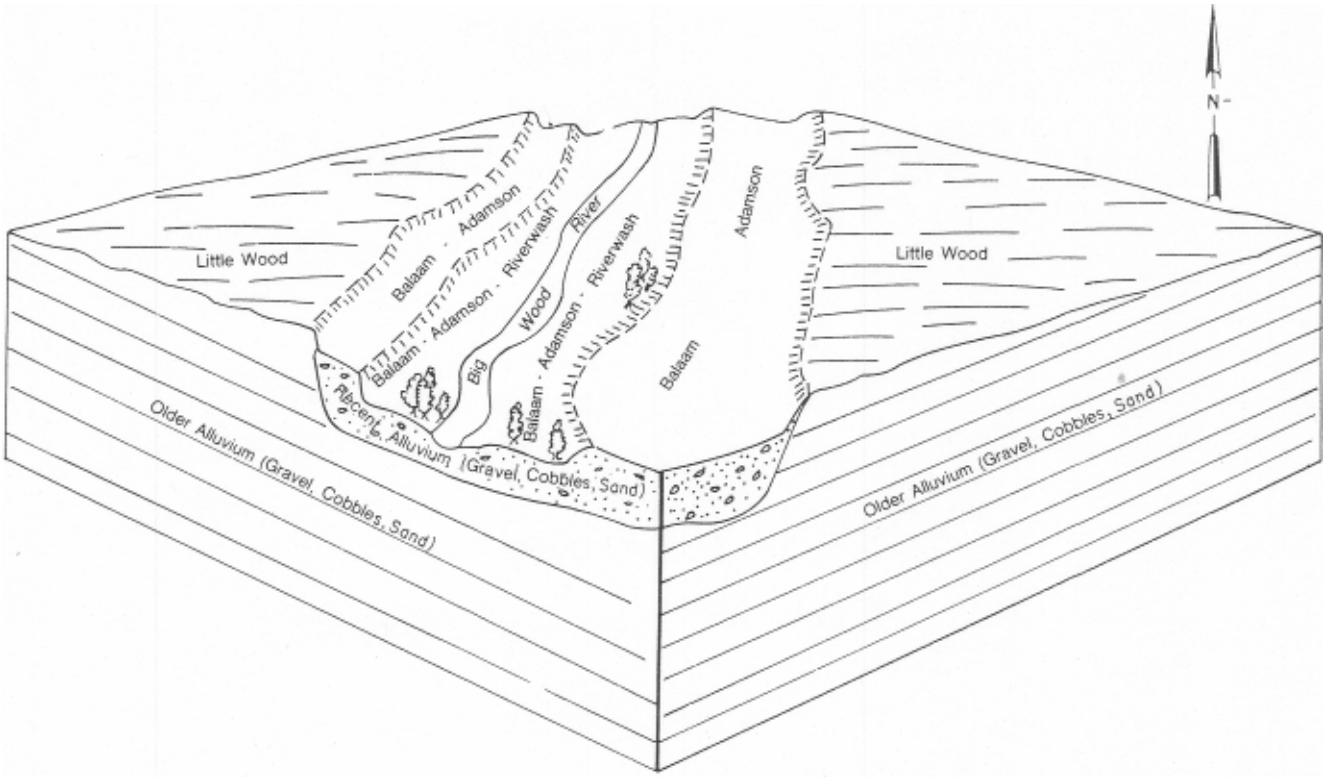

Figure 4.—Typical pattern of soils and underlying material in general soil map unit 11.

and west facing mountainsides and foothills; Winu soils-north- and east-facing mountainsides and foothills
Elevation: 4,800 to 8,500 feet
Frost-free period: 30 to 90 days
Average annual precipitation: 12 to 20 inches
Minor components: Rock outcrop; Mulshoe, Polecreek, Molyneux, and Laurentzen soils
Major uses: Rangeland, wildlife habitat

Well Drained Soils on Basalt Plains

Number of map units: 5
Percentage of survey area: 26

6. Lava flows-Cinderhurst

Lava flows, and very shallow soils that formed in tephra (fig. 2); on slopes of 2 to 15 percent

Percentage of survey area: 12
Landscape position: Cinderhurst soils-gently sloping areas of basalt plains; Lava flows-basalt plains
Elevation: 4,800 to 6,000 feet
Frost-free period: 60 to 90 days
Average annual precipitation: 12 to 16 inches
Minor components: Soils that are similar to the Cinderhurst soils but are 20 to 40 inches deep
Major use: Wildlife habitat

7. Deerhorn-Rehfield-Rock outcrop

Moderately deep and very deep soils that formed in eolian material over basalt and in eolian-influenced alluvium, and Rock outcrop; on slopes of 2 to 15 percent
Percentage of survey area: 5

Landscape position: Deerhorn soils-convex tops and side slopes of undulating basalt plains; Rehfield soils-drainageways; Rock outcrop-convex areas
Elevation: 4,600 to 5,000 feet
Frost-free period: 90 to 120 days
Average annual precipitation: 11 to 13 inches
Minor components: Cox, Wildors, and Trevino soils; Playas; Pagari soils
Major uses: Rangeland, wildlife habitat

8. Gooding-Hamrub

Deep soils that formed in alluvium over basalt and it loess over alluvium (fig. 3); on slopes of 2 to 20 percent
Percentage of survey area: 4

Landscape position: Gooding soils-intermounds, drainageways; Hamrub soils-mounds
Elevation: 4,600 to 5,300 feet
Frost-free period: 90 to 120 days
Average annual precipitation: 11 to 13 inches
Minor components: Yutrue soils, Rock outcrop, Adios and Bostrum soils
Major uses: Rangeland, wildlife habitat

9. McCarey-McBiggam-Bancroft

Moderately deep and very deep soils that formed in loess over residuum and in silty alluvium; on slopes of 1 to 30 percent
Percentage of survey area: 3
Landscape position: McCarey soils-convex tops and side slopes of undulating basalt plains; McBiggam and Bancroft soils-drainageways
Elevation: 4,800 to 5,600 feet
Frost-free period: 60 to 90 days
Average annual precipitation: 12 to 16 inches
Minor components. Pedleford soils, soils that are similar to the McCarey soils but are 10 to 20 inches deep, Molyneux soils
Major use: Rangeland
Minor uses: Cropland, hayland, pasture

10. McCarey-Justesen-Rock outcrop

Moderately deep and very deep soils that formed in

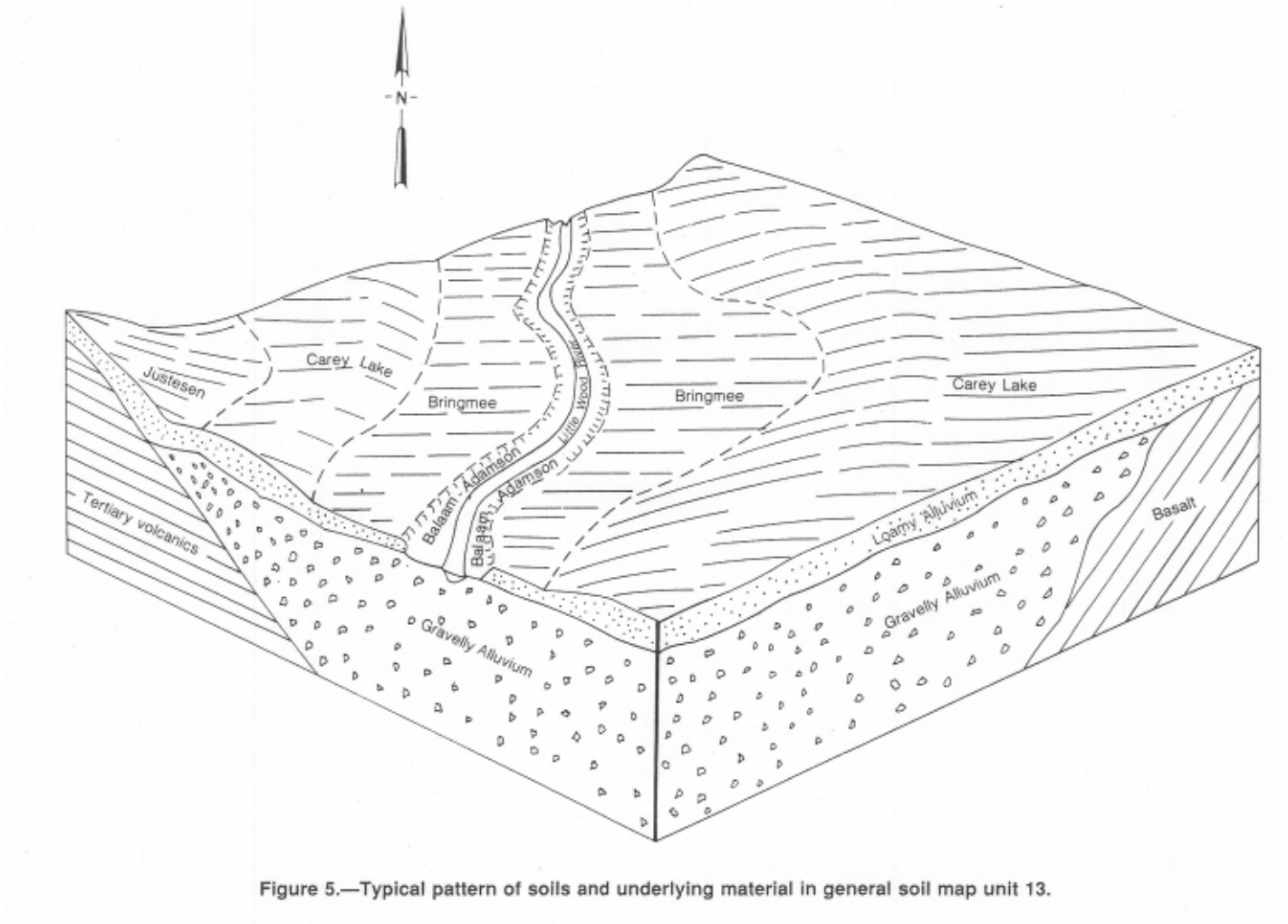

Figure 5.—Typical pattern of soils and underlying material in general soil map unit 13.

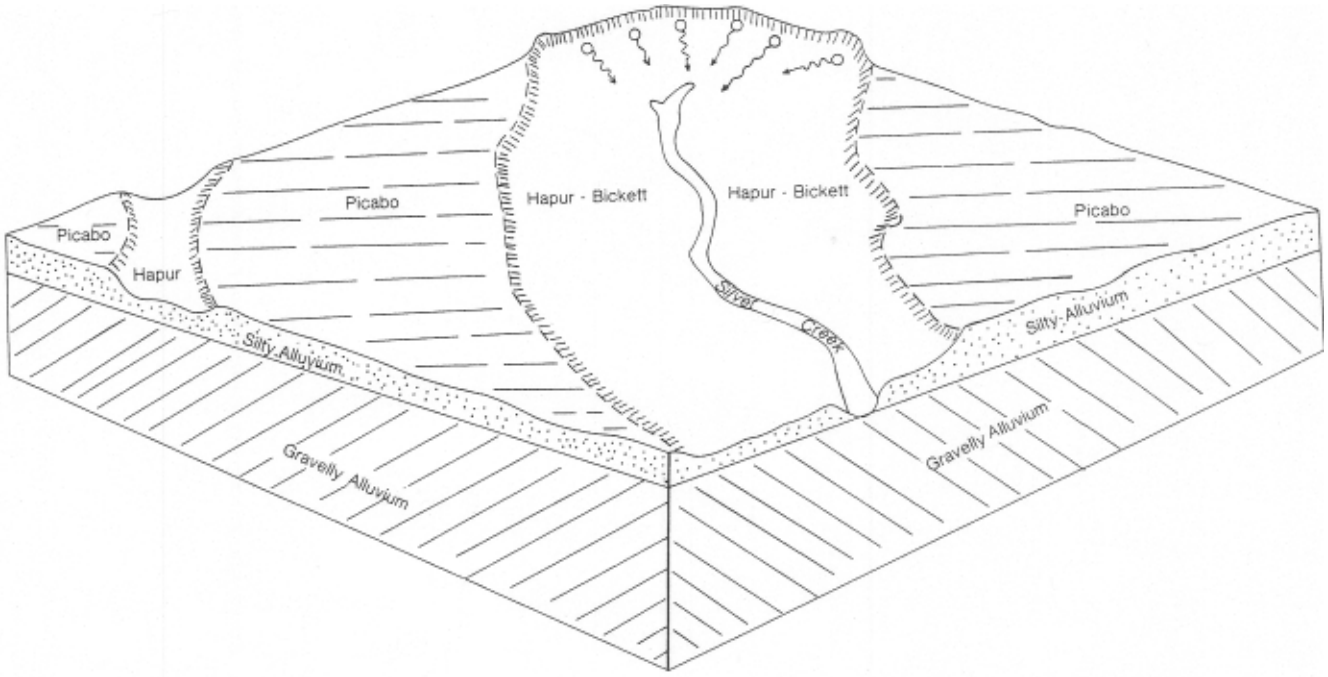

Figure 6.—Typical pattern of soils and underlying material in general soil map unit 14.

loess over residuum and in alluvium, and Rock outcrop; on slopes of 2 to 15 percent

Percentage of survey area: 2
Landscape position: McCarey soils-convex tops and side slopes of undulating basalt plains; Justesen soils-drainageways, depressions
Elevation: 4,700 to 5,000 feet
Frost-free period: 60 to 90 days
Average annual precipitation: 12 to 16 inches
Minor components: Soils that are similar to the McCarey soils but are 10 to 20 inches deep and have a very stony upper layer
Major uses: Rangeland, wildlife habitat

Well Drained and Somewhat Excessively Drained Soils on Fan Terraces and Stream Terraces

Number of map units: 3
Percentage of survey area: 14

11. Little Wood-Balaam-Adamson

Very deep, well drained and somewhat excessively drained soils that formed in alluvium (fig. 4); on slopes of 0 to 4 percent

Percentage of survey area: 7
Landscape position: Stream terraces along the major streams and rivers
Elevation: 4,700 to 6,000 feet
Frost-free period: 60 to 90 days
Average annual precipitation: 12 to 18 inches
Minor components: Drage, Marshdale, Bruneel, Hutton Variant, Isknat, and Gimlett soils; Riverwash
Major uses: Irrigated cropland, hayland, and pasture; rangeland; wildlife habitat

12. Peevywell-Muldoon-Simonton

Moderately deep to very deep, well drained soils that formed in alluvium; on slopes of 2 to 30 percent

Percentage of survey area: 4
Landscape position: Peevywell soils-convex areas of fan terraces; Muldoon and Simonton soils drainageways and depressions on fan terraces
Elevation: 4,800 to 6,000 feet
Frost-free period: 60 to 90 days
Average annual precipitation: 12 to 16 inches
Minor components: Manard, Goodington, Marshdale, Molyneux, Bruneel, and Rockybar soils
Major uses: Irrigated and nonirrigated cropland,

hayland, and pasture; rangeland; wildlife habitat; watershed

13. Carey Lake-Bringmee

Very deep, well drained soils that formed in alluvium (fig. 5); on slopes of 0 to 8 percent
Percentage of survey area: 3

Landscape position: Fan terraces, stream terraces
Elevation: 4,700 to 6,000 feet
Frost-free period: 60 to 90 days
Average annual precipitation: 12 to 16 inches
Minor components: Hutton, Little Wood, Adamson, Balaam, Bruneel, Marshdale, Bancroft, Molyneux, and Justesen soils
Major uses: Irrigated and nonirrigated cropland, hayland, and pasture; rangeland; wildlife habitat

Somewhat Poorly Drained to Very Poorly Drained Soils on Stream Terraces and Flood Plains

Number of map units: 1
Percentage of survey area: 2

14. Picabo-Hapur-Bickett

Very deep, somewhat poorly drained to very poorly drained soils that formed in alluvium (fig. 6); on slopes of 0 to 2 percent

Percentage of survey area: 2
Landscape position: Flood plains and stream terraces in the vicinity of the community of Picabo
Elevation: 4,700 to 5,500 feet
Frost-free period: 60 to 90 days
Average annual precipitation: 12 to 16 inches
Minor components: Bruneel soils, soils that are similar to the Picabo soils but are shallower to lime nodules
Major uses: Nonirrigated cropland, hayland, and pasture

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit is given under "Use and Management of the Soils."

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some included areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavior divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up *a soil series.* Except for differences in texture of the upper layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the upper layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Little Wood gravelly loam, 0 to 2 percent slopes, is a phase of the Little Wood series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called complexes or associations.

A complex consists of two or more soils or

miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Goodington-Manard complex, 2 to 8 percent slopes, is an example.

An *association is* made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Lavacreek-Vitale association, 30 to 60 percent slopes, is an example.

This survey includes *miscellaneous areas.* Such areas have little or no soil material and support little or no vegetation. Rubbleland is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Map Unit Descriptions

1-Adamson loam, 0 to 2 percent slopes

Composition

Adamson loam, 0 to 2 percent slopes, and similar inclusions-90 percent
Contrasting inclusions-10 percent

Characteristics of the Adamson Soil

Position on landscape: Stream terraces
Parent material. Mixed alluvium
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 19 inches-grayish brown loam
19 to 28 inches-grayish brown fine sandy loam 28 to 61 inches-light brownish gray very gravelly coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 28 inches; very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 28 inches
Runoff: Very slow
Hazard of water erosion: Slight
Frequency of flooding: Rare

Inclusions

Similar inclusions: Soils that have a fine sandy loam upper layer
Contrasting inclusions: Balaam gravelly sandy loam in convex areas (5 percent); Bruneel loam in depressions and drainageways (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Barley, oats, wheat, alfalfa hay, pasture
General management considerations:
- A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Border and corrugation systems are also suitable.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIs, irrigated

2-Adios-Gooding-Bostrum complex, 4 to 20 percent slopes

Composition

Adios stony loam, 8 to 20 percent slopes-35 percent
Gooding silt loam, 4 to 12 percent slopes-25 percent
Bostrum cobbly silt loam, 4 to 12 percent slopes-20 percent
Contrasting inclusions-20 percent

Characteristics of the Adios Soil

Position on landscape: Convex tops and side slopes of basalt plains

Parent material: Residuum, slope alluvium
Elevation: 4,600 to 4,900 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 5 inches-brown stony loam
5 to 23 inches-yellowish brown, light yellowish brown, and very pale brown clay and clay loam
23 to 27 inches-white, indurated duripan
27 inches-fractured rhyolite that has silica and lime in the fractures
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Low
Potential rooting depth: 22 to 31 inches
Restriction affecting rooting depth: Duripan at a depth of 23 inches
Runoff: Rapid
Hazard of water erosion: Severe

Characteristics of the Gooding Soil

Position on landscape: Intermounds and convex side slopes of basalt plains
Parent material: Alluvium over basalt or rhyolite
Elevation: 4,600 to 4,900
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 9 inches-brown and pale brown silt loam
9 to 49 inches-yellowish brown, pale brown, and very pale brown silty clay and silty clay loam
49 to 62 inches-very pale brown, weakly cemented duripan
62 inches-basalt that has a silica cap
Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 40 to 60 inches
Restriction affecting rooting depth: Duripan at a depth of 49 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Bostrum Soil

Position on landscape: Drainageways on basalt plains
Parent material: Residuum derived from basalt
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 4 inches-grayish brown and pale brown cobbly silt loam
4 to 28 inches-yellowish brown and brown silty clay
28 to 32 inches-light yellowish brown silty clay loam
32 inches-lime-coated basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Moderate
Potential rooting depth: 20 to 40 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Contrasting Inclusions

Furshur very channery loam on toe slopes (10 percent); Rock outcrop in convex areas (10 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Adios soil-Wyoming big sagebrush, bluebunch wheatgrass; Gooding soil--Wyoming big sagebrush, bluebunch wheatgrass; Bostrum soil-alkali sagebrush, bluebunch wheatgrass
Main limitations: Adios soil-stony upper layer, hazard of erosion, low available water capacity; Bostrum soil-cobbly upper layer, hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by stones and cobbles on the surface of the Adios and Bostrum soils. Prescribed burning is limited on the Bostrum soil by the inability of the alkali sagebrush to carry fire.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

Vls, nonirrigated

3-Adios association, 8 to 25 percent slopes

Composition

Adios stony loam, 8 to *25* percent slopes-50 percent

Adios loam, cool, 8 to 25 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Stony Adios Soil

Position on landscape: South- and west-facing sides of buttes
Parent material: Residuum, slope alluvium
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 5 inches-brown stony loam
5 to 23 inches-yellowish brown, light yellowish brown, and very pale brown clay and clay loam
23 to 27 inches-white, indurated duripan
27 inches-fractured rhyolite that has silica and lime in the fractures
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Low
Potential rooting depth: 22 to 31 inches
Restriction affecting rooting depth: Duripan at a depth of 23 inches
Runoff: Rapid
Hazard of water erosion: Severe

Characteristics of the Cool Adios Soil

Position on landscape. North- and east-facing sides of buttes
Parent material: Residuum, slope alluvium
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 46 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 7 inches-dark grayish brown and dark brown loam
7 to 25 inches-yellowish brown, light yellowish brown, and very pale brown clay and clay loam
25 to 28 inches-white, indurated duripan
28 inches-fractured rhyolite that has silica and lime in the fractures
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Low
Potential rooting depth: 22 to 31 inches
Restriction affecting rooting depth: Duripan at a depth of 25 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Furshur very channery loam on toe slopes (10 percent); Gooding silt loam in concave areas (5 percent); Rock outcrop in convex areas (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Stony Adios soil-Wyoming big sagebrush, bluebunch wheatgrass; cool Adios soil-Wyoming big sagebrush, bluebunch wheatgrass
Main limitations: Stony upper layer, hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment of brush is limited by stones on the surface.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

Vlc, nonirrigated

4-Balaam gravelly sandy loam, 0 to 2 percent slopes

Composition

Balaam gravelly sandy loam, 0 to 2 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Balaam Soil

Position on landscape: Stream terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 14 inches-grayish brown gravelly sandy loam
14 to 21 inches-light brownish gray very gravelly coarse sandy loam
21 to 61 inches-grayish brown extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Somewhat excessively drained

Permeability: Moderately rapid in the upper 21 inches; *very* rapid below this depth
Available water capacity: Very low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 21 inches
Runoff: Very slow
Hazard of water erosion: Slight

Contrasting Inclusions

Adamson loam in concave areas (5 percent); Bruneel loam in drainageways and depressions (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Barley, oats, wheat, alfalfa hay, pasture (fig. 7)
General management considerations:

- A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Border systems are also suitable.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland

Dominant vegetation in potential natural plant community:
Basin big sagebrush, bluebunch wheatgrass
Main limitation: Very low available water capacity
General management considerations:

- Brush management, proper distribution of livestock, and range seeding are needed.
- Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
- Range seeding is suitable on this unit. Drilling is the best suited method.
- Plants that can tolerate droughtiness are suitable for seeding.

Capability Classification

IIIc, irrigated; IVs, nonirrigated

5-Salaam very gravelly sandy loam, 2 to 4 percent slopes

Composition

Balaam very gravelly sandy loam, 2 to 4 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Balaam Soil

Position on landscape: Stream terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 6,000 feet
Average annual precipitation. About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 21 inches-grayish brown very gravelly sandy loam
21 to *35* inches-light brownish gray very gravelly coarse sandy loam
35 to *63* inches-grayish brown extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid in the upper *35* inches; very rapid below this depth
Available water capacity: Very low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of *35* inches
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Bruneel loam in drainageways *(*5 percent); Adamson loam in concave areas *(*5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Barley, oats, wheat, alfalfa hay, pasture
General management considerations.

- A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled

Figure 7.-Irrigated pasture in an area of Balaam gravelly sandy loam, 0 to 2 percent slopes.

application of water, reduces the rate of runoff, and minimizes the risk of water erosion.

• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland

Dominant vegetation in potential natural plant community:

Basin big sagebrush, bluebunch wheatgrass

Main limitation: Very low available water capacity

General management considerations:

• Brush management, proper distribution of livestock, and range seeding are needed.

• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.

• Range seeding is suitable on this unit. Drilling is the best suited method.

• Plants that can tolerate droughtiness are suitable for seeding.

Capability Classification

IVs, irrigated and nonirrigated

6-Balaam-Adamson complex, 0 to 2 percent slopes

Composition

Balaam very gravelly sandy loam, 0 to 2 percent slopes, and similar inclusions-60 percent

Adamson fine sandy loam, 0 to 2 percent slopes, and similar inclusions-35 percent

Contrasting inclusions-5 percent

Characteristics of the Balaam Soil

Position on landscape: Stream terraces

Parent material: Alluvium derived from various kinds of rock

Elevation: 4,700 to 6,000 feet

Average annual precipitation: About 14 inches

Average annual air temperature: About 42 degrees F

Frost-free period: About 75 days

Typical profile:

0 to 21 inches-grayish brown very gravelly sandy loam

21 to 35 inches-light brownish gray very gravelly coarse sandy loam

35 to 63 inches-multicolored extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid in the upper 35 inches; very rapid below this depth
Available water capacity: Very low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 35 inches
Runoff: Very slow
Hazard of water erosion: Slight
Shrink-swell potential: Low

Characteristics of the Adamson Soil

Position on landscape: Stream terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About *42* degrees F
Frost-free period: About 75 days
Typical profile:
0 to 5 inches-grayish brown fine sandy loam
5 to 19 inches-grayish brown loam
19 to *28* inches-grayish brown fine sandy loam
28 to *61* inches-light grayish brown very gravelly coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper *28* inches; very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of *28* inches
Runoff: Slow
Hazard of water erosion: Slight
Frequency of flooding: Rare
Shrink-swell potential: Low

Inclusions

Similar inclusions: Balaam gravelly sandy loam, Adamson loam in concave areas
Contrasting inclusions: Soils that are similar to the Balaam soil but are shallower to loose sand and gravel and are in convex areas (5 percent)

Major Uses

Cropland, hayland, and pasture
Currently grown irrigated crops: Barley, oats, wheat, alfalfa hay, pasture
General management considerations:
- A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Border systems are also suitable.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland
Dominant vegetation in potential natural plant community:
Basin big sagebrush, bluebunch wheatgrass
Main limitations: Very low and low available water capacity
General management considerations:
- Brush management, proper distribution of livestock, and range seeding are needed.
- Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
- Range seeding is suitable on this unit. Drilling is the best suited method.
- Plants that can tolerate droughtiness are suitable for seeding.

Capability Classification

IVs, irrigated and nonirrigated

7-Balaam-Adamson complex, cool, 0 to 2 percent slopes

Composition

Balaam gravelly sandy loam, 0 to *2* percent slopes-50 percent
Adamson fine sandy loam, 0 to *2* percent slopes-35 percent
Contrasting inclusions-15 percent

Characteristics of the Balaam Soil

Position on landscape: Convex areas of stream terraces
Parent material: Alluvium derived from various kinds of rock

Elevation: 5,200 to 6,000 feet
Average annual precipitation: About 16 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 65 days
Typical profile:
0 to 10 inches-grayish brown gravelly sandy loam
10 to 17 inches-brown very gravelly sandy loam
17 to 60 inches-multicolored extremely cobbly coarse sand
Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid in the upper 17 inches; very rapid below this depth
Available water capacity: Very low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and rock fragments at a depth of 17 inches
Runoff: Very slow
Hazard of water erosion: Slight
Frequency of flooding: Rare
Shrink-swell potential: Low

Characteristics of the Adamson Soil

Position on landscape: Concave areas of stream terraces
Parent material Alluvium derived from various kinds of rock
Elevation: 5,200 to 6,000 feet
Average annual precipitation: About 16 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 65 days
Typical profile:
0 to 9 inches-grayish brown fine sandy loam
9 to 22 inches-brown very fine sandy loam
22 to 48 inches-brown extremely cobbly coarse sand
48 to 60 inches-multicolored extremely stony coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 22 inches; very rapid below this depth
Available water capacity: Low
Potential rooting depth: More than 60 inches
Restriction affecting rooting depth: Loose sand and rock fragments at a depth of 22 inches
Runoff: Very slow
Hazard of water erosion: Slight
Frequency of flooding: Rare
Shrink-swell potential: Low

Contrasting Inclusions

Balaam very cobbly sandy loam (10 percent); Adamson gravelly fine sandy loam (5 percent)

Major Uses

Hayland and pasture

Currently grown irrigated crops: Alfalfa, pasture
General management considerations:
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVs, irrigated and nonirrigated

8-Balaam-Adamson-Riverwash complex, 0 to 2 percent slopes

Composition

Balaam gravelly sandy loam, flooded, 0 to 2 percent slopes-35 percent
Adamson fine sandy loam, flooded, 0 to 2 percent slopes-25 percent
Riverwash-20 percent Contrasting inclusions-20 percent

Characteristics of the Balaam Soil

Position on landscape: Flood plains
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 15 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 70 days
Typical profile:
0 to 10 inches-grayish brown gravelly sandy loam
10 to 17 inches-brown very gravelly sandy loam
17 to 60 inches-multicolored extremely cobbly coarse sand
Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid in the upper 17 inches; very rapid below this depth
Available water capacity: Very low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and rock

fragments at a depth of 17 inches
Runoff: Very slow
Hazard of water erosion: Slight
Depth to water table: 60 to 84 inches
Frequency of flooding: Occasional
Shrink-swell potential: Low

Characteristics of the Adamson Soil

Position on landscape: Flood plains
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 9 inches-grayish brown fine sandy loam
9 to 22 inches-brown very fine sandy loam
22 to 48 inches-brown extremely cobbly coarse sand
48 to 60 inches-multicolored extremely stony coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 22 inches; very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and rock fragments at a depth of 22 inches
Runoff: Very slow
Hazard of water erosion: Slight
Depth to water table: 48 to 60 inches
Frequency of flooding: Occasional
Shrink-swell potential: Low

Characteristics of the Riverwash

Position on landscape: Commonly in braided channels of major rivers and streams
Kind of material: Sandy, gravelly, or cobbly sediment, commonly occurring as gravel bars or sand bars
Vegetation: Little, if any
Special features: Frequently flooded, washed, and reworked by rivers and streams

Contrasting Inclusions

Bruneel loam in drainageways and depressions (10 percent); soils that are similar to the Balaam soil but are shallower to loose sand, gravel, and cobbles and are in convex areas (10 percent)

Major Use

Wildlife habitat

General management consideration:
• This unit provides important habitat for wildlife; therefore, it should be managed and protected for this use.

Capability Classification

IVs, irrigated and nonirrigated

9-Bancroft silt loam, 1 to 4 percent slopes

Composition

Bancroft silt loam, 1 to 4 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Bancroft Soil

Position on landscape: Basalt plains
Parent material. Silty alluvium
Elevation: 4,800 to 5,200 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 11 inches-brown silt loam
11 to 33 inches-yellowish brown and dark yellowish brown silty clay loam
33 to 42 inches-very pale brown silt loam
42 to 80 inches-very pale brown gravelly loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

McCarey loam on side slopes (5 percent); Goodington silt loam in depressions (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.

• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland

Dominant vegetation in potential natural plant community:
Threetip sagebrush, Idaho fescue
General management considerations.
• Brush management, proper distribution of livestock, and range seeding are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the inherent ability of threetip sagebrush to sprout from its roots.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IIIe, irrigated and nonirrigated

10-Bancroft silt loam, 4 to 8 percent slopes

Composition

Bancroft silt loam, 4 to 8 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Bancroft Soil

Position on landscape: Basalt plains
Parent material: Silty alluvium
Elevation: 4,800 to 5,200 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 11 inches-brown silt loam
11 to 33 inches-yellowish brown and dark yellowish brown silty clay loam
33 to 42 inches-very pale brown silt loam
42 to 80 inches-very pale brown gravelly loamy sand and gravelly loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Medium
Hazard of water erosion: Moderate

Contrasting Inclusions

McCarey loam and Manard very stony silt loam on convex side slopes (5 percent); Goodington silt loam in depressions (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland

Dominant vegetation in potential natural plant community:
Threetip sagebrush, Idaho fescue
Main limitation: Moderate hazard of water erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the inherent ability of threetip sagebrush to sprout from its roots.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IIIe, irrigated and nonirrigated

11-Bickett mucky peat, 0 to 2 percent slopes

Composition

Bickett mucky peat, 0 to 2 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Bickett Soil

Position on landscape: Flood plains
Parent material: Herbaceous plants over silty alluvium
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 6 inches-black mucky peat
6 to 11 inches-black muck
11 to 40 inches-light brownish gray silty clay loam
40 to 61 inches-dark gray loam
Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Available water capacity: Very high
Potential rooting depth: 60 inches or more for water-tolerant plants
Runoff: Ponded
Hazard of water erosion: None
Water table: 6 inches above the surface to 6 inches below
Frequency of flooding: Frequent

Contrasting Inclusions

Hapur silt loam in the higher lying areas (5 percent); Bickett mucky peat that has strata of sand and gravel between depths of 40 and 60 inches (5 percent)

Major Use

Wetland wildlife habitat

Dominant vegetation in potential natural plant community: Rushes, sedges, cattails, other wetland herbaceous plants
General management considerations:
• This unit provides open, marshy or swampy, shallow water areas that should be maintained in their natural state.
• Wildlife attracted to areas of this unit include ducks, geese, sandhill cranes, shore birds, muskrat, beaver, and songbirds.

Capability Classification

Vw, nonirrigated

12-Blackspar-Rock outcrop complex, 45 to 75 **percent slopes**

Composition

Blackspar very cobbly loam, 45 to 75 percent slopes 50 percent
Rock outcrop-25 percent
Contrasting inclusions-25 percent

Characteristics of the Blackspar Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Colluvium derived dominantly from quartzitic sandstone and conglomerate
Elevation: 5,200 to 8,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 3 inches-brown very cobbly loam
3 to 7 inches-yellowish brown very cobbly loam
7 to 17 inches-light yellowish brown extremely cobbly loam
17 inches-quartzitic sandstone *Depth class:* Shallow
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Rock Outcrop

Position on landscape: Ridges
Kind of material: Exposed bedrock

Contrasting Inclusions

Vitale very gravelly loam on south- and west-facing side slopes (15 percent); Lavacreek very gravelly silt loam on north- and east-facing slopes at elevations below 7,500 feet and on all aspects at elevations above 7.500 feet (5 percent); Dollarhide very gravelly silt loam on north- and east-facing slopes (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Low sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.

• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope and the hazard of erosion.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

13-Blackspot-Prudy association, 30 to 60 percent slopes

Composition

Blackspot very gravelly loam, 30 to 60 percent slopes45 percent
Prudy loam, 30 to 60 percent slopes-35 percent
Contrasting inclusions-20 percent

Characteristics of the Blackspot Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Mixed colluvium over calcareous quartzitic residuum
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 7 inches-grayish brown and brown very gravelly loam
7 to 14 inches-pale brown *very* gravelly loam
14 to 19 inches-white, indurated duripan
19 inches-fractured, calcareous quartzite
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Very low
Potential rooting depth: 13 to 17 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Prudy Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Mixed colluvium over calcareous quartzitic residuum
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 10 inches-dark grayish brown and dark brown loam
10 to 42 inches-brown and pale brown loam and gravelly loam
42 to 50 inches-white, indurated duripan
50 inches-fractured, calcareous quartzite
Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Potential rooting depth: 40 to 48 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Soils that are similar to the Blackspot soil but are 20 to 40 inches deep to a duripan and are in convex areas (10 percent); soils that are similar to the Prudy soil but are more than 35 percent rock fragments, are 20 to 40 inches deep to a duripan, and are on convex, north- and east-facing slopes (10 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community:

Blackspot soil-black sagebrush, bluebunch wheatgrass; Prudy soil-mountain big sagebrush, mountain snowberry, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
• Installation of pipelines and fences is limited by the slope and by the shallow depth of the Blackspot soil.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

14-Bostrum-Yutrue-Hamrub complex, 2 to 12 percent slopes

Composition

Bostrum cobbly silt loam, 2 to 8 percent slopes-40 percent

Yutrue silty clay, 2 to 8 percent slopes-30 percent
Hamrub silt loam, 2 to 12 percent slopes-20 percent
Contrasting inclusions-10 percent

Characteristics of the Bostrum Soil

Position on landscape: Drainageways on basalt plains
Parent material: Residuum derived from basalt
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 4 inches-grayish brown and pale brown cobbly silt loam
4 to 28 inches-yellowish brown and brown silty clay
28 to 32 inches-light yellowish brown silty clay loam
32 inches-lime-coated basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Moderate
Potential rooting depth. 20 to 40 inches
Runoff: Medium
Hazard of water erosion: Slight or moderate

Characteristics of the Yutrue Soil

Position on landscape: Intermounds on basalt plains
Parent material: Fine-textured alluvium
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 7 inches-pale brown silty clay
7 to 35 inches-pale brown and yellowish brown silty clay
35 to 63 inches-light yellowish brown silty clay loam and white clay loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Medium
Hazard of water erosion: Slight or moderate

Characteristics of the Hamrub Soil

Position on landscape: Mounds on basalt plains
Parent material: Loess over alluvium
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 10 inches-brown and yellowish brown silt loam
10 to 41 inches-yellowish brown silty clay loam
41 to 43 inches-very pale brown silt loam
43 to 48 inches-white, indurated duripan
48 inches-fractured rhyolitic bedrock
Depth class: Deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 40 to 50 inches
Restriction affecting rooting depth: Duripan at a depth of 43 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Contrasting Inclusions

Yutrue silty clay that has slopes of 0 to 2 percent and is in areas southeast of Magic Reservoir (5 percent); Rock outcrop in convex areas (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Bostrum and Yutrue soils-alkali sagebrush, bluebunch wheatgrass; Hamrub soil-Wyoming big sagebrush, bluebunch wheatgrass
Main limitations: Bostrum soil-cobbly upper layer, hazard of erosion; Yutrue soil-silty clay upper layer, hazard of erosion; Hamrub soil-hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are chemical spraying and mechanical treatment. Prescribed burning is limited on the Bostrum and Yutrue soils by the inability of alkali sagebrush to carry fire.
• Range seeding is suitable on this unit. Drilling is the best suited method.
• Plants that can tolerate shrinking and swelling of the Yutrue soil are suitable for seeding.

Capability Classification

VIs, nonirrigated

15-Bringmee loam, 0 to 2 percent slopes

Composition

Bringmee loam, 0 to 2 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Bringmee Soil

Position on landscape: Fan terraces, stream terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 7 inches-dark grayish brown loam
7 to 47 inches-grayish brown, brown, and dark grayish brown clay loam, sandy clay loam, and loam
47 to 61 inches-light yellowish brown gravelly sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow in the upper 47 inches; moderately rapid or rapid below this depth
Available water capacity: High
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Sand and gravel at a depth of 47 inches
Runoff: Very slow
Hazard of water erosion: Slight

Contrasting Inclusions

Little Wood gravelly loam in convex areas (5 percent); Marshdale loam and Bruneel loam in depressions and drainageways (10 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Border and corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIc, irrigated and nonirrigated

16-Bringmee loam, 2 to 4 percent slopes

Composition

Bringmee loam, 2 to 4 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Bringmee Soil

Position on landscape: Fan terraces, stream terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 7 inches-dark grayish brown loam
7 to 47 inches-grayish brown, brown, and dark grayish brown clay loam, sandy clay loam, and loam
47 to 61 inches-light yellowish brown gravelly sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow in the upper 47 inches; moderately rapid or rapid below this depth
Available water capacity: High
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Sand and gravel at a depth of 47 inches
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Little Wood gravelly loam in convex areas (5 percent); Marshdale loam and Bruneel loam in drainageways and depressions (10 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue

management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated and nonirrigated

17-Bringmee loam, 4 to 8 percent slopes

Composition

Bringmee loam, 4 to 8 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Bringmee Soil

Position on landscape: Fan terraces, stream terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 7 inches-dark grayish brown loam
7 to 47 inches-grayish brown, brown, and dark grayish brown clay loam, sandy clay loam, and loam
47 to 61 inches-light yellowish brown gravelly sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow in the upper 47 inches; moderately rapid or rapid below this depth
Available water capacity: High
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Sand and gravel at a depth of 47 inches
Runoff: Medium
Hazard of water erosion: Moderate

Contrasting Inclusions

Molyneux loam in concave areas (5 percent); Little Wood gravelly loam along streams (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated and nonirrigated

18-Bringmee-Hutton complex, 1 to 4 percent slopes

Composition

Bringmee loam, 1 to 4 percent slopes-50 percent
Hutton clay loam, 1 to 2 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Bringmee Soil

Position on landscape: Fan terraces, stream terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 7 inches-dark grayish brown loam
7 to 47 inches-grayish brown, brown, and dark grayish brown clay loam, sandy clay loam, and loam
47 to 61 inches-light yellowish brown gravelly coarse sandy loam

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow in the upper 47 inches; moderately rapid or rapid below this depth
Available water capacity: High
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Sand and gravel at a depth of 47 inches
Runoff: Slow
Hazard of water erosion: Slight

Characteristics of the Hutton Soil

Position on landscape: Flood plains
Parent material: Mixed alluvium
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 19 inches-dark gray clay loam
19 to 62 inches-gray clay
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Water table at a depth of 12 to 30 inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 12 to 30 inches
Frequency of flooding: Frequent

Contrasting Inclusions

Marshdale loam and Bruneel loam in drainageways and depressions (20 percent)

Major Uses

Hayland and pasture

Currently grown nonirrigated crops: Pasture, grass legume hay
Dominant vegetation in potential natural plant community:
Bringmee soil-basin big sagebrush, Idaho fescue; Hutton soil-tufted hairgrass, sedges, rushes, willow
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• Wetness in areas of the Hutton soil limits the choice of plants and the period of cutting or grazing and increases the risk of winterkill.
• Plants that can tolerate wetness are suitable for seeding on the Hutton soil.
• Grazing on the Hutton soil should be deferred until the water table lowers and the upper part of the soil is firm.
• Irrigation is needed on the Bringmee soil. A sprinkler system is the best suited method.

Capability Classification

IVw, irrigated and nonirrigated

19-Bringmee-Little Wood complex, 1 to 4 percent slopes

Composition

Bringmee gravelly loam, 1 to 4 percent slopes-45 percent
Little Wood very gravelly loam, 1 to 4 percent slopes 35 percent
Contrasting inclusions-20 percent

Characteristics of the Bringmee Soil

Position on landscape: Fan terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 11 inches-dark grayish brown gravelly loam
11 to 22 inches-grayish brown clay loam
22 to 33 inches-grayish brown sandy clay loam
33 to 42 inches-grayish brown gravelly sandy loam
42 to 61 inches-light olive brown very gravelly loamy coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow in the upper 33 inches; moderately rapid or rapid below this depth
Available water capacity: High
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Sand and gravel at a depth of 42 inches
Runoff: Slow
Hazard of water erosion: Slight

Characteristics of the Little Wood Soil

Position on landscape: Stream terraces
Parent material: Alluvium derived from various kinds of rock

Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 13 inches-dark brown and brown very gravelly loam
13 to 26 inches-brown and yellowish brown very gravelly sandy clay loam
26 to 32 inches-yellowish brown extremely gravelly coarse sandy loam
32 to 42 inches-brown extremely gravelly loamy coarse sand
42 to 61 inches-pale brown extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper *32* inches; very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth. Sand and gravel at a depth of *32* inches
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Bruneel gravelly loam and Hutton clay loam in depressions and drainageways *(15* percent); Bringmee loam that has slopes of more than *4* percent (5 percent)

Major Uses

Hayland and pasture

Currently grown irrigated crops: Alfalfa, pasture
General management considerations:
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Border and corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVs, irrigated and nonirrigated

20-Bruneel loam, 0 to 2 percent slopes

Composition

Bruneel loam, 0 to *2* percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Bruneel Soil

Position on landscape: Flood plains
Parent material: Recent alluvium derived from various kinds of rock
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 14 inches-grayish brown loam
14 to 23 inches-light gray loam
23 to 27 inches-grayish brown very gravelly loamy sand
27 to 61 inches-multicolored extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate in the upper 23 inches; very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more for water tolerant plants
Restrictions affecting rooting depth: Loose sand and gravel at a depth of *27* inches; water table at a depth of *12* to *18* inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 12 to 18 inches
Frequency of flooding: Occasional

Contrasting Inclusions

Marshdale loam in drainageways (5 percent); Bringmee loam in the higher lying areas (5 percent)

Major Uses

Hayland and pasture

Currently grown nonirrigated crops: Pasture, grass legume hay
Dominant vegetation in potential natural plant community:
Tufted hairgrass, sedges, rushes
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• Wetness limits the choice of plants and the period of cutting or grazing.

• Plants that can tolerate wetness are suitable for seeding.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

Capability Classification

IVw, nonirrigated

21-Carey Lake loam, 0 to 2 percent slopes

Composition

Carey Lake loam, 0 to 2 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Carey Lake Soil

Position on landscape: Fan terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 12 inches-grayish brown loam
12 to 20 inches-grayish brown clay loam
20 to 42 inches-grayish brown and brown fine sandy loam
42 to 72 inches-grayish brown and brown fine sandy loam and loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Very slow
Hazard of water erosion: Slight

Contrasting Inclusions

Bringmee loam on the higher lying stream terraces (5 percent); Hutton clay loam along drainageways and in depressions (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Border and corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIc, irrigated and nonirrigated

22-Carey Lake loam, 2 to 4 percent slopes

Composition

Carey Lake loam, 2 to 4 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Carey Lake Soil

Position on landscape: Fan terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 12 inches-grayish brown loam
12 to 20 inches-grayish brown clay loam
20 to 42 inches-grayish brown and brown fine sandy loam
42 to 72 inches-grayish brown and brown fine sandy loam and loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Bringmee loam on the higher lying stream terraces (5 percent); Hutton clay loam along drainageways and in depressions (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture

General management considerations:

• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.

• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.

• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are also suitable.

• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIc, irrigated; IIIe, nonirrigated

23-Cox-Rehfield-Rock outcrop complex, 2 to 15 percent slopes

Composition

Cox very stony sandy loam, 2 to 15 percent slopes-35 percent
Rehfield loamy sand, 2 to 8 percent slopes-30 percent
Rock outcrop-20 percent
Contrasting inclusions-15 percent

Characteristics of the Cox Soil

Position on landscape: Convex tops and side slopes of basalt plains
Parent material: Eolian material derived from various kinds of rock
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile.
0 to 3 inches-dark brown very stony sandy loam
3 to 12 inches-dark yellowish brown very cobbly fine sandy loam
12 inches-basalt
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Characteristics of the Rehfield Soil

Position on landscape: Depressions and drainageways on basalt plains
Parent material: Eolian-influenced alluvium derived from various kinds of rock
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 3 inches-brown loamy sand
3 to 11 inches-brown sandy loam
11 to 42 inches-yellowish brown sandy loam and sandy clay loam
42 to 67 inches-light yellowish brown loamy sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Potential rooting depth: 60 inches or more
Runoff: Slow
Hazard of water erosion: Slight
Hazard of wind erosion: Severe

Characteristics of the Rock Outcrop

Kind of material: Exposed basalt

Contrasting Inclusions

Soils that are similar to the Rehfield soil but are 20 to 40 inches deep to bedrock and are in depressions (10 percent); Pagari very cobbly sandy loam in convex areas (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Cox soil-basin big sagebrush, bluebunch wheatgrass; Rehfield soil-basin big sagebrush, needleandthread, Indian ricegrass

Main limitations: Very stony sandy loam upper layer in the Cox soil; areas of Rock outcrop; loamy sand upper layer, droughtiness, and hazard of wind erosion on the Rehfield soil

General management considerations:

• Brush management, proper distribution of livestock,

and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the very stony sandy loam upper layer in the Cox soil and by the areas of Rock outcrop.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

VIs, nonirrigated

24-Deerhorn-Rehfield-Rock outcrop complex, 2 to 15 percent slopes

Composition

Deerhorn fine sandy loam, 2 to 15 percent slopes-40 percent
Rehfield sandy loam, 2 to 8 percent slopes-30 percent
Rock outcrop-20 percent
Contrasting inclusions-10 percent

Characteristics of the Deerhorn Soil

Position on landscape: Convex tops and side slopes of basalt plains
Parent material: Eolian material over basalt
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 9 inches-dark grayish brown fine sandy loam
9 to 17 inches-brown sandy clay loam
17 to 21 inches-very pale brown loam
21 to 24 inches-very pale brown, indurated duripan
24 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 20 to 30 inches
Restriction affecting rooting depth: Duripan at a depth of 21 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Rehfield Soil

Position on landscape: Depressions and drainageways on basalt plains
Parent material: Eolian-influenced alluvium derived from various kinds of rock
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 11 inches-brown sandy loam
11 to 23 inches-yellowish brown sandy loam
23 to 42 inches-yellowish brown sandy clay loam
42 to 67 inches-light yellowish brown loamy sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Potential rooting depth: 60 inches or more
Runoff. Slow or medium
Hazard of water erosion: Slight or moderate

Characteristics of the Rock Outcrop

Kind of material: Exposed basalt

Contrasting Inclusions

Wildors *very* stony sandy loam on convex tops and playas in depressions (10 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Basin big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the areas of Rock outcrop and the areas of included Wildors very stony sandy loam.
• Range seeding is suitable on this unit. It is limited by the areas of Rock outcrop, the hazard of erosion, and the areas of included Wildors very stony sandy loam. Drilling is the best suited method.

Capability Classification

VIe, nonirrigated

25-Deerhorn-Wildors complex, 2 to 8 percent slopes

Composition

Deerhorn fine sandy loam, 2 to 8 percent slopes-45 percent

Wildors very stony sandy loam, 2 to 8 percent slopes-30 percent
Contrasting inclusions-25 percent

Characteristics of the Deerhorn Soil

Position on landscape: Concave side slopes of basalt plains
Parent material: Eolian material over basalt
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 9 inches-dark grayish brown fine sandy loam
9 to 17 inches-brown sandy clay loam
17 to 21 inches-very pale brown loam
21 to 24 inches - very pale brown, indurated duripan
24 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 20 to 30 inches
Restriction affecting rooting depth: Duripan at a depth of 21 inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Characteristics of the Wildors Soil

Position on landscape: Flat ridgetops and convex side slopes of basalt plains
Parent material: Eolian material over basalt
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 9 inches-brown and yellowish brown very stony sandy loam
9 to 15 inches-yellowish brown extremely stony loam
15 to 21 inches-light yellowish brown extremely stony loam
21 to 24 inches-very pale brown, indurated duripan
24 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Potential rooting depth: 21 to 28 inches
Restriction affecting rooting depth: Duripan at a depth of 21 inches
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Rehfield sandy loam in depressions (10 percent); soils that are similar to the Wildors soil but are 10 to 20 inches deep to a duripan (10 percent); Rock outcrop on ridges and playas in depressions (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Basin big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the areas of Rock outcrop and the very stony sandy loam upper layer in the Wildors soil.
• Range seeding is suitable on this unit. It is limited by the areas of Rock outcrop, the very stony sandy loam upper layer and very low available water capacity of the Wildors soil, and the hazard of erosion on the Deerhorn soil. Drilling is the best suited method of seeding.
• Seeding late in fall produces the best results.
• Plants that can tolerate droughtiness are suitable for seeding.

Capability Classification

VIs, nonirrigated

26-Deerhorn-Wildors-Trevino complex, 2 to 15 percent slopes

Composition

Deerhorn fine sandy loam, 2 to 15 percent slopes-40 percent
Wildors very stony sandy loam, 2 to 15 percent slopes-30 percent
Trevino extremely stony silt loam, 2 to 15 percent slopes-20 percent
Contrasting inclusions-10 percent

Characteristics of the Deerhorn Soil

Position on landscape: Concave side slopes of buttes and basalt plains

Parent material: Eolian material over basalt
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About *47* degrees F
Frost-free period: About 110 days
Typical profile:
0 to 8 inches-dark grayish brown and brown fine sandy loam
8 to 15 inches-brown loam
15 to 21 inches-yellowish brown loam
21 to 28 inches-white, indurated duripan
28 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 20 to 30 inches
Restriction affecting rooting depth: Duripan at a depth of *21* inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Wildors Soil

Position on landscape: Flat ridges and convex side slopes of buttes and basalt plains
Parent material: Eolian material over basalt
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 10 inches-brown very stony sandy loam
10 to 15 inches-brown and yellowish brown very stony sandy loam
15 to 18 inches-light yellowish brown very stony loam
18 to *22* inches-very pale brown very stony sandy loam
22 to *24* inches-very pale brown, indurated duripan
24 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Potential rooting depth: 21 to 28 inches
Restriction affecting rooting depth: Duripan at a depth of *22* inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Characteristics of the Trevino Soil

Position on landscape: Eroded drainageways on the sides of buttes and basalt plains
Parent material: Eolian-influenced slope alluvium
Elevation: 4,600 to 5,000 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 5 inches-brown extremely stony silt loam
5 to 9 inches-pale brown extremely stony silt loam
9 to 12 inches-light yellowish brown extremely stony silt loam
12 inches-basalt
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Potential rooting depth: 10 to *20* inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Contrasting Inclusions

Rehfield sandy loam on playas in depressions (5 percent); Rock outcrop on ridges (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Deerhorn and Wildors soils-basin big sagebrush, bluebunch wheatgrass; Trevino soil-Wyoming big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the areas of Rock outcrop and the stones in the upper layer of the Wildors and Trevino soils.
• Range seeding is suitable on this unit. It is limited by the hazard of erosion, the areas of Rock outcrop, the stones in the upper layer of the Wildors and Trevino soils, and the restricted available water capacity.
• Drilling is the best suited method of seeding.
• Seeding late in fall produces the best results.
• Plants that can tolerate droughtiness are suitable for seeding.

Capability Classification

VIs, nonirrigated

27-Dollarhide-Rock outcrop complex, 60 to 75 percent slopes

Composition

Dollarhide *very* gravelly fine sandy loam, 60 to 75 percent slopes-50 percent Rock outcrop-25 percent
Contrasting inclusions-25 percent

Characteristics of the Dollarhide Soil

Position on landscape: North- and east-facing mountainsides and ridges at elevations below 7,500 feet; all aspects of mountainsides and ridges at elevations above 7,500 feet
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,700 to 9,250 feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 7 inches-brown very gravelly fine sandy loam
7 to 13 inches-yellowish brown extremely cobbly fine sandy loam
13 inches-quartzite
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Rock Outcrop

Position on landscape: Ridges *Kind of material:* Exposed bedrock

Contrasting Inclusions

Povey gravelly loam in drainageways (10 percent); Rubbleland on toe slopes (10 percent); Ketchum very gravelly loam in forested areas (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Mountain big sagebrush, Idaho fescue
Main limitations: Slope, hazard of erosion
General management consideration.
• Proper distribution of livestock is needed.

Capability Classification

VIIIe, nonirrigated

28-Drage gravelly loam, 4 to 8 percent slopes

Composition

Drage gravelly loam, 4 to 8 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Drage Soil

Position on landscape: Fan terraces
Parent material: Alluvium derived from mixed igneous and metamorphic rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 8 inches-dark grayish brown gravelly loam
8 to 14 inches-brown gravelly loam
14 to 20 inches-yellowish brown very gravelly clay loam
20 to 61 inches-very pale brown extremely gravelly sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability. Moderately slow
Available water capacity: Low
Potential rooting depth: 60 inches or more
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Justesen loam on toe slopes (5 percent); Rockybar extremely cobbly loam on the steeper side slopes (5 percent)

Major Uses

Current uses: Hayland, pasture, rangeland
Potential use: Cropland

Hayland and pasture

Currently grown irrigated crops: Alfalfa, pasture
General management considerations:
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage.
• The best suited method of irrigation is a sprinkler system.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland

Dominant vegetation in potential natural plant community: Basin big sagebrush, bluebunch wheatgrass Main limitation: Low available water capacity General management considerations:

Brush management, proper distribution of livestock, and range seeding are needed.

- Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
- Range seeding is suitable on this unit. Drilling is the best suited method.
- Plants that can tolerate droughtiness are suitable for seeding.

Cropland

Currently grown irrigated crops: Wheat, barley, oats General management considerations:

- A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated and nonirrigated

29-Drage gravelly loam, 8 to 12 percent slopes

Composition

Drage gravelly loam, 8 to 12 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Drage Soil

Position on landscape: Fan terraces
Parent material: Alluvium derived from mixed igneous and metamorphic rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile.

0 to 8 inches-dark grayish brown gravelly loam
8 to 14 inches-brown gravelly loam
14 to 20 inches-yellowish brown very gravelly clay loam
20 to 61 inches-very pale brown extremely gravelly sandy loam

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 60 inches or more
Runoff: Medium
Hazard of water erosion: Moderate

Contrasting Inclusions

Justesen loam (5 percent), Povey gravelly loam (5 percent), and Vitale very gravelly loam (5 percent) on toe slopes

Major Uses

Hayland and pasture

Currently grown irrigated crops: Alfalfa, pasture
General management considerations:

- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland

Dominant vegetation in potential natural plant community: Basin big sagebrush, bluebunch wheatgrass
Main limitation: Low available water capacity
General management considerations:

- Brush management, proper distribution of livestock, and range seeding are needed.
- Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
- Range seeding is suitable on this unit. Drilling is the best suited method.
- Plants that can tolerate droughtiness are suitable for seeding.

Capability Classification

IVe, irrigated; IIIe, nonirrigated

30-Drage gravelly loam, cool, 2 to 15 percent slopes

Composition

Drage gravelly loam, cool, 2 to 15 percent slopes-80 percent
Contrasting inclusions-20 percent

Characteristics of the Drage Soil

Position on landscape: Stream terraces, fan terraces
Parent material: Mixed alluvium
Elevation: 5,500 to 6,100 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 65 days
Typical profile:
0 to 14 inches-dark grayish brown and brown gravelly loam
14 to 30 inches-yellowish brown very gravelly clay loam
30 to 61 inches-very pale brown extremely gravelly sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Sand and gravel at a depth of 30 inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Contrasting Inclusions

Little Wood very gravelly loam on stream terraces (10 percent); Molyneux loam in concave areas (10 percent)

Major Uses

Current use: Rangeland
Potential uses: Hayland, pasture

Rangeland
Dominant vegetation in potential natural plant community. Mountain big sagebrush, Idaho fescue *Main limitation:* Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Hayland and pasture
Currently grown irrigated crops: Alfalfa, pasture
General management considerations:
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system, but corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVe, irrigated; IIIe, nonirrigated

31-Drage very gravelly loam, cool, 0 to 3 percent slopes

Composition

Drage very gravelly loam, cool, 0 to 3 percent slopes85 percent
Contrasting inclusions-15 percent

Characteristics of the Drage Soil

Position on landscape: Stream terraces, fan terraces
Parent material: Mixed alluvium
Elevation: 5,000 to 6,100 feet
Average annual precipitation: About 16 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 65 days
Typical profile:
0 to 16 inches-very dark grayish brown and dark grayish brown very gravelly loam
16 to 41 inches-dark brown and brown very gravelly sandy clay loam and very gravelly clay loam
41 to 61 inches-yellowish brown and light yellowish brown extremely gravelly sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability. Moderately slow
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Sand and gravel at a depth of 41 inches
Runoff: Slow
Hazard of water erosion: Slight
Shrink-swell potential: Moderate

Contrasting Inclusions

Isknat gravelly clay loam (5 percent); Bringmee loam (5 percent); Hutton Variant clay loam (5 percent)

Major Uses

Hayland and pasture

Currently grown irrigated crops: Alfalfa, pasture

General management considerations:

- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system, but corrugation systems are also suitable.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVs, irrigated and nonirrigated

32-Earcree-Lockman complex, 30 to 60 percent slopes

Composition

Earcree gravelly coarse sandy loam, 30 to 60 percent slopes-50 percent

Lockman sandy loam, 30 to 60 percent slopes-30 percent

Contrasting inclusions-20 percent

Characteristics of the Earcree Soil

Position on landscape: North- and east-facing mountainsides at elevations below 7,500 feet; all aspects of mountainsides at elevations above 7,500 feet

Parent material: Colluvium and alluvium over residuum derived from granite

Elevation: 6,000 to 8,200 feet

Average annual precipitation: About 20 inches

Average annual air temperature: About 39 degrees F

Frost-free period: Less than 60 days

Typical profile:

0 to 37 inches-dark grayish brown and brown gravelly coarse sandy loam

37 to 52 inches-pale brown gravelly coarse sandy loam

52 to 70 inches-pale brown very gravelly loamy coarse sand

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately rapid

Available water capacity: Moderate

Potential rooting depth: 60 inches or more

Runoff: Very rapid

Hazard of water erosion. Very severe

Characteristics of the Lockman Soil

Position on landscape: North- and east-facing mountainsides

Parent material: Colluvium derived from granite

Elevation: 6,000 to 8,200 feet

Average annual precipitation: About 20 inches

Average annual air temperature: About 39 degrees F

Frost-free period: Less than *60* days

Typical profile:

0 to 15 inches-brown sandy loam

15 to 23 inches-pale brown gravelly sandy loam

23 to 44 inches-pale brown gravelly loamy sand

44 to 58 inches-partially weathered granitic rock

58 inches-granitic rock

Depth class: Deep

Drainage class: Well drained

Permeability: Moderately rapid

Available water capacity: Low

Potential rooting depth: 40 to 60 inches

Runoff: Very rapid

Hazard of water erosion: Very severe

Contrasting Inclusions

Soils that are similar to the Earcree soil but receive supplemental moisture in the lower part of the profile from springs and support quaking aspen (10 percent); soils that are 10 to 20 inches deep to bedrock and Rock outcrop in convex areas (10 percent)

Major Uses

Rangeland
(Earcree Soil)

Dominant vegetation in potential natural plant community:

Mountain big sagebrush, mountain snowberry, Idaho fescue

General management considerations:

- Brush management and proper distribution of livestock are needed.
- Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope and the hazard of erosion.
- Range seeding generally is not suitable on this unit because of the slope and the hazard of erosion.

• Fences and stock water pipelines are limited by the slope.

Woodland
(Lockman Soil)

Dominant vegetation in potential natural plant community: Douglas fir, mountain snowberry
Average site index for Douglas fir (50-year site curve): 50
Maximum average annual growth for Douglas fir: 68 cubic feet per acre from a stand of trees 45 years old
Main limitations: Hazard of erosion, slope, low available water capacity, hazard of windthrow

Grazable understory
(Lockman Soil)

Common forest understory plants: Elk sedge, heartleaf arnica, pine reedgrass, mountain snowberry
General management considerations:
• Where the canopy cover is more than 40 percent, the understory is sparse and has low value as forage. Where the canopy is less dense, the understory provides good forage.
• Forage production can be increased by seeding disturbed areas to suitable plants and deferring grazing until seedlings are well established.

Capability Classification

VIIe, nonirrigated

33-Earcree-Moonstone association, 8 to 30 percent slopes

Composition

Earcree gravelly coarse sandy loam, 8 to 30 percent slopes-50 percent
Moonstone gravelly coarse sandy loam, 8 to 30 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Earcree Soil

Position on landscape: North- and east-facing slopes of foothills
Parent material: Colluvium and slope alluvium over residuum derived from granite
Elevation: 5,200 to 6,500 feet
Average annual precipitation: About 18 inches
Average annual air temperature. About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 37 inches-dark grayish brown and brown gravelly coarse sandy loam
37 to 52 inches-pale brown gravelly coarse sandy loam
52 to 70 inches-pale brown very gravelly loamy coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Potential rooting depth: 60 inches or more
Runoff: Rapid or very rapid
Hazard of water erosion: Severe or very severe

Characteristics of the Moonstone Soil

Position on landscape: South- and west-facing slopes of foothills
Parent material: Colluvium and residuum derived from granite
Elevation: 5,200 to 6,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 26 inches-dark grayish brown and brown gravelly coarse sandy loam
26 to 34 inches-pale brown gravelly coarse sandy loam
34 inches-partially weathered granitic rock
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Rapid or very rapid
Hazard of water erosion: Severe or very severe

Contrasting Inclusions

Marshdale loam in drainageways (15 percent); Bauscher loam on fan terraces and toe slopes (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Mountain big sagebrush, Idaho fescue
Main limitation: Hazard of erosion
General management considerations.
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.

• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVe, nonirrigated

34-Earcree-Moonstone association, 30 to 60 percent slopes

Composition

Earcree gravelly coarse sandy loam, 30 to 60 percent slopes-45 percent
Moonstone gravelly coarse sandy loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-25 percent

Characteristics of the Earcree Soil

Position on landscape: North- and east-facing mountainsides at elevations below 7,500 feet; all aspects of mountainsides at elevations above 7,500 feet
Parent material: Colluvium and slope alluvium over residuum derived from granite
Elevation: 5,200 to 7,800 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 37 inches-dark grayish brown and brown gravelly coarse sandy loam
37 to 52 inches-pale brown gravelly coarse sandy loam
52 to 70 inches-pale brown very gravelly loamy coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Potential rooting depth: 60 inches or more
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Moonstone Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Colluvium and residuum derived from granite
Elevation: 5,200 to 7,800 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 21 inches-dark grayish brown and brown gravelly coarse sandy loam
21 to 32 inches-grayish brown gravelly coarse sandy loam
32 inches-granitic rock
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Bauscher loam on toe slopes (10 percent); soils that are similar to the Earcree soil but receive supplemental moisture in the lower part of the profile from springs and support quaking aspen (10 percent); soils that are similar to the Moonstone soil but are 10 to 20 inches deep to bedrock and are on ridges (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Mountain big sagebrush, Idaho fescue
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope and the hazard of erosion.
• Range seeding generally is not suitable on this unit because of the slope and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

35-Elkcreek-Gaib complex, 30 to 60 percent slopes

Composition

Elkcreek loam, 30 to 60 percent slopes-50 percent
Gaib very gravelly loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Elkcreek Soil

Position on landscape: Concave areas on south- and west-facing mountainsides
Parent material: Residuum derived from andesite and basalt
Elevation: 5,000 to 6,500 feet
*Average annual precipitation:*About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 11 inches-grayish brown and brown loam
11 to 28 inches-yellowish brown and light yellowish brown clay loam
28 to 34 inches-yellowish brown sandy clay loam
34 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 26 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Gaib Soil

Position on landscape: Convex areas on south- and west-facing mountainsides
Parent material: Residuum derived from andesite, latite, and basalt
Elevation: 5,000 to 6,500 feet
Average annual precipitation. About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 4 inches-brown very gravelly loam
4 to 12 inches-dark yellowish brown very cobbly clay loam
12 inches-basalt
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Winu stony loam on north- and east-facing slopes (10 percent); Rock outcrop in convex areas (10 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Mountain big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope, the hazard of erosion, and the areas of Rock outcrop.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope, the depth to bedrock, and the areas of Rock outcrop.

Capability Classification

VIIe, nonirrigated

36-Elkcreek-Polecreek complex, 4 to 30 percent slopes

Composition

Elkcreek loam, 4 to 30 percent slopes-55 percent
Polecreek very stony loam, 4 to 15 percent slopes-30 percent
Contrasting inclusions-15 percent

Characteristics of the Elkcreek Soil

Position on landscape: Side slopes of foothills
Parent material: Residuum derived from andesite and basalt
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 11 inches-grayish brown and brown loam
11 to 28 inches-yellowish brown and light yellowish brown clay loam
28 to 34 inches-yellowish brown loam
34 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 26 to 40 inches
Runoff: Rapid or very rapid
Hazard of water erosion: Severe or very severe

Characteristics of the Polecreek Soil

Position on landscape: Ridges and eroded drainageways on foothills
Parent material: Residuum derived from andesite and basalt

Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 4 inches-dark brown very stony loam
4 to 6 inches-brown very cobbly clay
6 to 13 inches-brown very gravelly clay
13 inches-basalt
Depth class: Shallow
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Contrasting Inclusions

Mulshoe very stony loam in convex areas (10 percent); Laurentzen silt loam in drainageways (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Elkcreek soil-mountain big sagebrush, Idaho fescue; Polecreek soil-alkali sagebrush, Idaho fescue
Main limitations: Very stony loam upper layer in the Polecreek soil, hazard of erosion
General management considerations.
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the very stony loam upper layer in the Polecreek soil and by the hazard of erosion. Prescribed burning is limited by the inability of alkali sagebrush to carry fire and by the hazard of erosion.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

VIs, nonirrigated

37-Elksel-Fried man-Starhope complex, 30 to 60 percent slopes

Composition

Elksel very cobbly loam, 30 to 60 percent slopes-45 percent
Friedman cobbly loam, 30 to 60 percent slopes-20 percent
Starhope very cobbly clay loam, 30 to 60 percent slopes-20 percent
Contrasting inclusions-15 percent

Characteristics of the Elksel Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Colluvium and residuum derived from andesite, latite, and basalt
Elevation: 5,000 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 10 inches-grayish brown and dark grayish brown very cobbly loam
10 to 17 inches-brown very cobbly clay
17 to 33 inches-yellowish brown extremely cobbly clay
33 to 45 inches-yellowish brown extremely cobbly sandy clay
45 inches-andesite
Depth class: Deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Friedman Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Colluvium derived from andesite, latite, and welded tuff
Elevation: 5,000 to 7,500 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 5 inches-dark brown cobbly loam
5 to 17 inches-dark brown gravelly loam
17 to 24 inches-brown gravelly clay loam
24 to 36 inches-dark yellowish brown very gravelly clay
36 to 47 inches-yellowish brown very gravelly clay loam
47 to 54 inches-brown very gravelly sandy clay loam
54 inches-partially weathered latite

Depth class: Deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Moderate
Potential rooting depth. 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Starhope Soil

Position on landscape: Eroded areas on south- and west-facing mountainsides
Parent material: Residuum derived from andesite, latite, and welded tuff
Elevation: 5,000 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 3 inches-grayish brown very cobbly clay loam
3 to 19 inches-brown clay loam
19 to 22 inches-pale brown gravelly clay loam
22 inches-welded tuff
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Winridge clay loam on ridges (5 percent); Starhope loam in gently sloping areas (5 percent); Rock outcrop in convex areas (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Elksel soil-mountain big sagebrush, bluebunch wheatgrass; Friedman soil-mountain big sagebrush, Idaho fescue; Starhope soil-low sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope and the hazard of erosion.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

38-Elksei-Peevywell-Furshur complex, 30 to 60 percent slopes

Composition

Elksel gravelly loam, 30 to 60 percent slopes-35 percent
Peevywell cobbly loam, 30 to 60 percent slopes-30 percent
Furshur very channery loam, 30 to 60 percent slopes 20 percent
Contrasting inclusions-15 percent

Characteristics of the Elksel Soil

Position on landscape: Convex areas on mountainsides
Parent material: Colluvium over residuum derived from rhyolite and andesite
Elevation: 4,700 to 5,600 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 90 days
Typical profile:
0 to 12 inches-grayish brown and yellowish brown gravelly loam
12 to 42 inches-yellowish brown and brownish yellow very gravelly clay and extremely gravelly clay
42 to 54 inches-white duripan
54 inches-fractured andesite
Depth class: Deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 40 to 50 inches
Restriction affecting rooting depth: Duripan at a depth of 42 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Peevywell Soil

Position on landscape: Concave areas on mountainsides
Parent material: Colluvium and alluvium derived from rhyolite and andesite
Elevation: 4,700 to 5,600 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 90 days

Typical profile:

0 to 5 inches-brown and yellowish brown cobbly loam
5 to 13 inches-yellowish brown gravelly clay loam
13 to 31 inches-yellowish brown and brown gravelly clay
31 to 40 inches-reddish yellow, indurated duripan
40 inches-weathered andesite

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 24 to 35 inches
Restriction affecting rooting depth: Duripan at a depth of 31 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Furshur Soil

Position on landscape: Undulating convex areas on mountainsides
Parent material: Residuum and slope alluvium derived from rhyolite
Elevation: 4,700 to 5,600 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 90 days
Typical profile:

0 to 2 inches-dark grayish brown very channery loam
2 to 5 inches-brown clay loam
5 to 15 inches-yellowish brown and brownish yellow clay and gravelly clay
15 to 20 inches-very pale brown duripan
20 inches-fractured, layered rhyolitic bedrock that has lime and silica in the fractures

Depth class: Shallow
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Very low
Potential rooting depth: 14 to 20 inches
Restriction affecting rooting depth: Duripan at a depth of 15 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Smelter loam in gently sloping areas (5 percent); Friedman cobbly loam on north- and east-facing slopes (5 percent); Rock outcrop on ridges (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community:

Elksel and Peevywell soils-Wyoming big sagebrush, bluebunch wheatgrass; Furshur soil low sagebrush, bluebunch wheatgrass

General management considerations:

- Brush management and proper distribution of livestock are needed.
- Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope and by the inability of low sagebrush to carry fire.
- Fences and stock water pipelines are limited by the slope and by the depth to bedrock in the Furshur soil.
- Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

39-Elksel-Starhope-Rock outcrop complex, 30 to 60 percent slopes

Composition

Elksel very cobbly loam, 30 to 60 percent slopes-45 percent
Starhope *very* cobbly clay loam, 30 to 60 percent slopes-25 percent
Rock outcrop-20 percent
Contrasting inclusions-10 percent

Characteristics of the Elksel Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Colluvium and residuum derived from andesite, latite, and basalt
Elevation: 5,000 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:

0 to 10 inches-grayish brown and dark grayish brown very cobbly loam
10 to 17 inches-brown very cobbly clay
17 to 33 inches-yellowish brown extremely cobbly clay
33 to 45 inches-yellowish brown extremely cobbly sandy clay
45 inches-andesite

Depth class: Deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Starhope Soil

Position on landscape: Eroded areas on south- and west-facing mountainsides
Parent material: Residuum derived from andesite, latite, and welded tuff
Elevation: 5,000 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 40 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 3 inches-grayish brown very cobbly clay loam
3 to 19 inches-brown clay loam
19 to 22 inches-pale brown gravelly
brown gravelly clay loam 22 inches-welded tuff
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Rock Outcrop

Position on landscape: Ridges *Kind of material:* Exposed bedrock

Contrasting Inclusions

Friedman cobbly loam on north- and east-facing slopes (5 percent); Starhope loam in gently sloping areas (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Elksel soil-mountain big sagebrush, bluebunch wheatgrass; Starhope soil-low sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope and the hazard of erosion.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

40-Friedman-Elksel-Win ridge complex, 30 to 60 percent slopes

Composition

Friedman cobbly loam, 30 to 60 percent slopes-40 percent
Elksel very cobbly loam, 30 to 60 percent slopes-25 percent
Winridge clay loam, 30 to 60 percent slopes-20 percent
Contrasting inclusions-15 percent

Characteristics of the Friedman Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Colluvium derived from andesite, latite, and welded tuff
Elevation: 5,000 to 7,500 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 5 inches-dark brown cobbly loam
5 to 17 inches-dark brown gravelly loam
17 to 24 inches-brown gravelly clay loam
24 to 36 inches-dark yellowish brown very gravelly clay
36 to 47 inches-yellowish brown very gravelly clay loam
47 to 54 inches-brown very gravelly sandy clay loam
54 inches-weathered latite
Depth class: Deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Moderate
Potential rooting depth: 40 to 60 inches *Runoff:* Very rapid
Hazard of water erosion: Very severe

Characteristics of the Elksel Soil

Position on landscape: South- and west-facing mountainsides

Parent material: Colluvium and residuum derived from andesite, latite, and basalt
Elevation: 5,000 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About *75* days
Typical profile:
0 to 10 inches-grayish brown and dark grayish brown very cobbly loam
10 to 17 inches-brown very cobbly clay
17 to 33 inches-yellowish brown extremely cobbly clay
33 to *45* inches-yellowish brown extremely cobbly sandy clay
45 inches-andesite
Depth class: Deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Winridge Soil

Position on landscape: Convex and eroded areas on north- and east-facing mountainsides
Parent material: Colluvium and residuum derived from andesite, latite, and welded tuff
Elevation: 5,000 to *7,500* feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to *4* inches-dark grayish brown clay loam
4 to 16 inches-dark grayish brown and brown gravelly clay and clay
16 to 23 inches-olive brown sandy clay loam
23 inches-partially weathered andesite
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Smelter loam in gently sloping areas *(5* percent); soils that are similar to the Friedman soil but receive supplemental moisture in the middle part of the profile from springs, support trees, and are on concave north- and east-facing slopes *(5* percent);
Rock outcrop on ridges and in convex areas *(5* percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Friedman soil-mountain big sagebrush, Idaho fescue; Elksel soil-mountain big sagebrush, bluebunch wheatgrass; Winridge soil-low sagebrush, Idaho fescue
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope and the hazard of erosion.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

41-Gaib-Rock outcrop complex, 30 to 60 percent slopes

Composition

Gaib very gravelly loam, 30 to 60 percent slopes-50 percent
Rock outcrop-30 percent
Contrasting inclusions-20 percent

Characteristics of the Gaib Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Residuum derived from andesite, latite, and basalt
Elevation: 5,000 to *7,000* feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to *5* inches-brown very gravelly loam
5 to 13 inches-dark yellowish brown very cobbly clay loam
13 inches-basalt
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow

Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Rock Outcrop

Position on landscape: Convex areas, ridgetops
Kind of material: Exposed basalt

Contrasting Inclusions

Elkcreek loam in concave areas (10 percent); Winu stony loam on north- and east-facing slopes (10 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Gaib soil-mountain big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope, the hazard of erosion, and the areas of Rock outcrop.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope, the depth to bedrock, the areas of Rock outcrop, and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

42-Gimlett very gravelly sandy loam, 0 to 2 percent slopes

Composition

Gimlett very gravelly sandy loam, 0 to 2 percent slopes-95 percent Contrasting inclusions-5 percent

Characteristics of the Gimlett Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 5,300 to 6,000 feet
Average annual precipitation: About 17 inches
Average annual air temperature: About 40 degrees F
Frost-free period: About 65 days
Typical profile:
0 to 3 inches-very dark grayish brown very gravelly sandy loam
3 to 9 inches-very dark grayish brown very gravelly loam
9 to 18 inches-dark grayish brown very gravelly loam
18 to 27 inches-dark brown very gravelly sandy loam
27 to 33 inches-yellowish brown extremely cobbly sandy loam
33 to 38 inches-yellowish brown extremely cobbly loamy coarse sand
38 to 63 inches-brown extremely cobbly coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper *33* inches; very rapid below this depth
Available water capacity: Very low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 27 inches
Runoff: Very slow
Hazard of water erosion: Slight
Shrink-swell potential: Low

Contrasting Inclusions

Isknat gravelly clay loam; Little Wood very gravelly loam; Gimlett soils that have a very cobbly loam upper layer

Major Uses

Rangeland

Dominant vegetation in potential natural plant community: Mountain big sagebrush, Idaho fescue (fig. *8)*
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Drilling is the best suited method of range seeding.

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.

Figure 8.-Typical area of Gimlett very gravelly sandy loam, 0 to 2 percent slopes. The dominant vegetation is mountain big sagebrush and Idaho fescue.

- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVs, irrigated and nonirrigated

43-Gooding-Gooding, eroded-Hamrub complex, 2 to 12 percent slopes

Composition

Gooding silt loam, 2 to 12 percent slopes-40 percent
Gooding very cobbly clay loam, 2 to 8 percent slopes, eroded-30 percent
Hamrub silt loam, 2 to 12 percent slopes-20 percent
Contrasting inclusions-10 percent

Characteristics of the Noneroded Gooding Soil

Position on landscape: Intermounds on basalt plains
Parent material: Alluvium over basalt and rhyolite
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches

Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 9 inches-brown and pale brown silt loam
9 to 49 inches-yellowish brown, pale brown, and very pale brown silty clay and silty clay loam
49 to 62 inches-very pale brown, weakly cemented duripan
62 inches-basalt that has a silica cap
Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 40 to 60 inches
Restriction affecting rooting depth: Duripan at a depth of 49 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Eroded Gooding Soil

Position on landscape: Drainageways on basalt plains
Parent material: Alluvium over basalt and rhyolite
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 2 inches-grayish brown very cobbly clay loam
2 to 42 inches-dark brown, dark yellowish brown, pale brown, and light yellowish brown silty clay and silty clay loam
42 to 62 inches-very pale brown, weakly cemented duripan
62 inches-basalt that has a silica cap
Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 40 to 60 inches
Restriction affecting rooting depth: Duripan at a depth of 42 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Hamrub Soil

Position on landscape: Mounds on basalt plains
Parent material: Loess over alluvium
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 10 inches-brown and yellowish brown silt loam
10 to 41 inches-yellowish brown silty clay loam
41 to 43 inches-very pale brown silt loam
43 to 48 inches-white, indurated duripan
48 inches-fractured rhyolitic bedrock
Depth class: Deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 40 to 50 inches
Restriction affecting rooting depth: Duripan at a depth of 43 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Contrasting Inclusions

Bostrum cobbly silt loam and Gooding very stony clay loam in eroded drainageways (5 percent); Rock outcrop in convex areas (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Noneroded Gooding soil and Hamrub soil
Wyoming big sagebrush, bluebunch wheatgrass; eroded Gooding soil-alkali sagebrush, bluebunch wheatgrass
Main limitations: Hazard of erosion; very cobbly upper layer in the eroded Gooding soil
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Prescribed burning is limited by the inability of alkali sagebrush to carry fire.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

VIs, nonirrigated

44-Goodington silt loam, 2 to 4 percent slopes

Composition

Goodington silt loam, 2 to 4 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Goodington Soil

Position on landscape: Basalt plains
Parent material: Loess over residuum derived dominantly from basalt
Elevation: 4,800 to 6,200 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 10 inches-dark grayish brown and dark brown silt loam
10 to 26 inches-brown silty clay
26 to 34 inches-brown silty clay loam
34 to 56 inches-light yellowish brown silty clay loam
56 inches-basalt
Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 40 to 60 inches
Runoff: Slow
Hazard of water erosion: Moderate

Contrasting Inclusions

Manard very stony silt loam and Manard silt loam in convex areas (5 percent); soils that are similar to Manard very stony silt loam but are less than 20 inches deep to basalt and are in eroded, convex areas (5 percent)

Major Uses

Current uses: Cropland, hayland, pasture
Potential use: Rangeland

Cropland, hayland, and pasture
Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland
Dominant vegetation in potential natural plant community. Mountain big sagebrush, bluebunch wheatgrass
Main limitation: Hazard of erosion *General management considerations:*
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IIIe, irrigated and nonirrigated

45-Goodington-Manard complex, 2 to 8 percent slopes

Composition

Goodington silt loam, 2 to 4 percent slopes-45 percent
Manard very stony silt loam, 2 to 8 percent slopes-40 percent
Contrasting inclusions-15 percent

Characteristics of the Goodington Soil

Position on landscape: Concave areas on basalt plains
Parent material: Loess over residuum derived dominantly from basalt
Elevation: 4,800 to 6,200 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 5 inches-dark grayish brown silt loam
5 to 15 inches-dark brown silt loam
15 to 28 inches-brown silty clay
28 to 38 inches-brown silty clay loam
38 to 46 inches-light yellowish brown silt loam
46 to 48 inches-very pale brown silt loam
48 inches-basalt
Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 40 to 60 inches
Restriction affecting rooting depth: Bedrock at a depth of 48 inches

Runoff: Slow
Hazard of water erosion: Moderate

Characteristics of the Manard Soil

Position on landscape: Convex areas on basalt plains
Parent material: Residuum derived from basalt
Elevation: 4,800 to 6,200 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 11 inches-dark grayish brown very stony silt loam
11 to 20 inches-brown silty clay
20 to 26 inches-brown clay
26 to 28 inches-very pale brown, indurated duripan
28 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Low
Potential rooting depth: 20 to 37 inches
Restriction affecting rooting depth: Duripan at a depth of 26 inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Contrasting Inclusions

Manard silt loam in gently sloping areas (5 percent); soils that are similar to the Manard soil but are 10 to 20 inches deep to bedrock and are in eroded, convex areas (5 percent); Rock outcrop in convex areas (5 percent)

Major Uses

Hayland and pasture
Currently grown irrigated crops: Alfalfa, pasture
General management considerations:
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• Because of the hazard of erosion, sprinkler irrigation is best suited to this unit.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland
(Goodington Soil)

Dominant vegetation in potential natural plant community:
Mountain big sagebrush, bluebunch wheatgrass
Main limitation: Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this soil. Drilling is the best suited method.

(Manard Soil)
Dominant vegetation in potential natural plant community:
Alkali sagebrush, Idaho fescue
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are chemical spraying and mechanical treatment. Prescribed burning is limited by the inability of alkali sagebrush to carry fire.
• Range seeding is not suitable on this soil because of the stoniness of the upper layer and the hazard of erosion.

Capability Classification

VIs, nonirrigated

46-Hapur silt loam, 0 to 2 percent slopes

Composition

Hapur silt loam, 0 to 2 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Hapur Soil

Position on landscape: Flood plains
Parent material: Silty alluvium
Elevation: 4,700 to 5,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 3 inches-gray silt loam
3 to 15 inches-gray silty clay loam
15 to 30 inches-light gray clay loam
30 to 44 inches-light gray fine sandy loam
44 to 51 inches-light gray loamy fine sand
51 to 63 inches-light gray very gravelly loamy sand
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow

Available water capacity: High
Potential rooting depth: 60 inches or more
Restrictions affecting rooting depth: Loose sand and gravel at a depth of 51 inches; water table at a depth of 6 to 12 inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 6 to 12 inches
Frequency of flooding: Frequent

Contrasting Inclusions

Bruneel loam and Picabo silt loam in the higher lying areas (10 percent); Bickett mucky peat in the lower lying areas (5 percent)

Major Uses

Hayland and pasture
Dominant vegetation in potential natural plant community:
Tufted hairgrass, sedges, rushes, shrubby cinquefoil
Currently grown nonirrigated crops: Grass-legume hay, pasture
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• Wetness limits the choice of plants and the production of deep-rooted crops.
• Plants that can tolerate wetness are suitable for seeding.
• Providing drainage is difficult because most areas have poor outlets and are subject to seasonal flooding.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

Capability Classification

Vw, nonirrigated

47-Hapur-Bickett complex, 0 to 2 percent slopes

Composition

Hapur silt loam, 0 to 2 percent slopes-55 percent
Bickett mucky peat, 0 to 2 percent slopes-35 percent
Contrasting inclusions-10 percent

Characteristics of the Hapur Soil

Position on landscape: Flood plains
Parent material: Silty alluvium
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 3 inches-gray silt loam
3 to 15 inches-gray silty clay loam
15 to 30 inches-light gray clay loam
30 to 44 inches-light gray fine sandy loam
44 to 51 inches-light gray loamy fine sand
51 to 63 inches-light gray very gravelly loamy sand
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Available water capacity: Moderate
Potential rooting depth: 60 inches or more
Restrictions affecting rooting depth. Loose sand and gravel at a depth of 51 inches; water table at a depth of *6* to 12 inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 6 to 12 inches
Frequency of flooding: Frequent

Characteristics of the Bickett Soil

Position on landscape: Flood plains
Parent material: Material derived from herbaceous plants over silty alluvium
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to *6* inches-black mucky peat
6 to 11 inches-black muck
11 to 40 inches-light brownish gray silty clay loam
40 to *61* inches-dark gray loam
Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Available water capacity: Very high
Potential rooting depth: 60 inches or more for water tolerant plants
Runoff: Ponded
Hazard of water erosion: None
Water table: 6 inches above the surface to *6* inches below
Frequency of flooding: Frequent

Contrasting Inclusions

Soils that are similar to the Hapur soil but are calcareous throughout and are in the lower lying areas (10 percent)

Major Uses

Hayland and pasture
(Hapur Soil)

Dominant vegetation in potential natural plant community:
Tufted hairgrass, sedges, rushes, shrubby cinquefoil
Currently grown nonirrigated crops: Grass-legume hay, pasture
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• Wetness limits the choice of plants and the production of deep-rooted crops.
• Providing drainage is difficult because most areas have poor outlets and are subject to seasonal flooding.
• Plants that can tolerate wetness are suitable for seeding.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

Wetland wildlife habitat
(Bickett Soil)

Dominant vegetation in potential natural plant community:
Rushes, sedges, cattails, other wetland herbaceous plants
General management considerations:
• This soil provides open, marshy or swampy, shallow water areas that should be maintained in their natural state.
• Wildlife attracted to areas of this soil include ducks, geese, sandhill cranes, shore birds, muskrat, beaver, and songbirds.

Capability Classification

Vw, nonirrigated

48-Hapur-Picabo silt loams, 0 to 2 percent slopes

Composition

Hapur silt loam, 0 to 2 percent slopes-50 percent
Picabo silt loam, 0 to 2 percent slopes-40 percent
Contrasting inclusions-10 percent

Characteristics of the Hapur Soil

Position on landscape: Depressions on flood plains
Parent material: Silty alluvium *Elevation:* 4,700 to 5,000 feet *Average annual precipitation:* About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 3 inches-gray silt loam
3 to 15 inches-gray silty clay loam
15 to 30 inches-light gray clay loam
30 to 44 inches-light gray fine sandy loam
44 to 51 inches-light gray loamy fine sand
51 to 63 inches-light gray very gravelly loamy sand
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Available water capacity: Moderate
Potential rooting depth: 60 inches or more
Restrictions affecting rooting depth: Loose sand and gravel at a depth of 51 inches; water table at a depth of 6 to 12 inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 6 to 12 inches
Frequency of flooding: Frequent

Characteristics of the Picabo Soil

Position on landscape: Convex areas on stream terraces
Parent material: Silty alluvium
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 9 inches-grayish brown silt loam
9 to 16 inches-light brownish gray silt loam
16 to 23 inches-light gray loam
23 to 39 inches-light gray silt loam
39 to 51 inches-white gravelly silt loam
51 to 53 inches-white silt loam
53 to 55 inches-gray silt loam
55 to 61 inches-gray very fine sandy loam
61 to 72 inches-dark gray extremely gravelly loamy sand
Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Available water capacity: High
Potential rooting depth: 60 inches or more
Restrictions affecting rooting depth: Water table at a depth of 24 to 48 inches; lime nodules at a depth of 36 to 50 inches
Runoff: Very slow
Hazard of water erosion: Slight
Depth to water table: 24 to 48 inches
Frequency of flooding: Occasional

Contrasting Inclusions

Bickett mucky peat in the lower lying areas (5 percent); Picabo gravelly loam (5 percent)

Major Uses

Hayland and pasture
(Hapur Soil)

Dominant vegetation in potential natural plant community:
Tufted hairgrass, sedges, rushes
Currently grown nonirrigated crops: Grass-legume hay, pasture
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• Wetness limits the choice of plants and the production. of deep-rooted crops.
• Providing drainage is difficult because most areas have poor outlets and are subject to seasonal flooding.
• Plants that can tolerate wetness are suitable for planting.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

(Picabo Soil)

Dominant vegetation in potential natural plant community:
Shrubby cinquefoil, sedges, tufted hairgrass
Currently grown nonirrigated crops: Grass-legume hay, pasture
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• Supplemental irrigation may be needed during the growing season to ensure adequate moisture for crop production. The best suited method is a sprinkler system.
• Plants that can tolerate a fluctuating water table and seasonal wetness are suitable for planting.
• Grazing should be deferred until the water table lowers and the soil is firm.

Cropland
(Picabo Soil)

Currently grown nonirrigated crops: Wheat, barley, oats
General management considerations:
• Providing drainage is difficult because most areas have poor outlets and are subject to seasonal flooding.
• A suitable cropping system, crop residue management, and applications of fertilizer help to minimize the risk of erosion.
• Supplemental irrigation may be needed during the growing season to ensure adequate moisture for crop production.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of erosion.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

Vw, nonirrigated

49-Hutton clay loam, 0 to 2 percent slopes

Composition

Hutton clay loam, 0 to 2 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Hutton Soil

Position on landscape: Flood plains
Parent material: Mixed alluvium
Elevation: 4,700 to 5,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 19 inches-dark gray clay loam
19 to 62 inches-gray clay
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Water table at a depth of 12 to 30 inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 12 to 30 inches
Frequency of flooding: Frequent

Contrasting Inclusions

Carey Lake loam in the steeper areas (5 percent); Marshdale loam in drainageways and depressions (5 percent)

Major Uses

Hayland and pasture

Dominant vegetation in potential natural plant community: Tufted hairgrass, sedges, rushes, willow

Currently grown nonirrigated crops: Pasture, grass-legume hay
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• Wetness limits the choice of plants and the period of cutting or grazing and increases the risk of winterkill.
• Plants that can tolerate wetness are suitable for planting.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

Capability Classification

IVw, irrigated and nonirrigated

50-Hutton Variant clay loam, 0 to 2 percent slopes

Composition

Hutton Variant clay loam, 0 to 2 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Hutton Variant Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,950 to 6,000 feet
Average annual precipitation: About 16 inches
Average annual air temperature: About 40 degrees F
Frost-free period: About 65 days
Typical profile:
0 to 8 inches-very dark gray clay loam
8 to 13 inches-dark gray clay
13 to 17 inches-dark grayish brown clay
17 to 24 inches-grayish brown gravelly clay
24 to 39 inches-grayish brown very gravelly sandy clay loam
39 to 52 inches-brown extremely gravelly sandy loam
52 to 66 inches-multicolored extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Very slow in the upper 39 inches: very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 39 inches
Runoff: Slow
Hazard of water erosion: Slight
Shrink-swell potential: High

Contrasting Inclusions

Soils that are similar to the Hutton Variant soil but have 35 to 60 percent coarse fragments between depths of 2 and 35 inches (10 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Border and corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIs, irrigated and nonirrigated

51-Isknat gravelly clay loam, 0 to 2 percent slopes

Composition

Isknat gravelly clay loam, 0 to 2 percent slopes-95 percent
Contrasting inclusions-5 percent

Characteristics of the Isknat Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,950 to 6,100 feet
Average annual precipitation: About 16 inches
Average annual air temperature: About 40 degrees F
Frost-free period: About 65 days
Typical profile:
0 to 11 inches-very dark gray and very dark grayish brown gravelly clay loam
11 to 26 inches-dark grayish brown very gravelly clay loam and very gravelly sandy clay loam

26 to 35 inches-brown very gravelly sandy clay loam
35 to 61 inches-brown and pale brown extremely gravelly sandy loam and extremely gravelly loamy sand

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow in the upper 35 inches; rapid or very rapid below this depth
Available water capacity: Low
Potential rooting depth. 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 35 inches
Runoff: Slow
Hazard of water erosion: Slight
Shrink-swell potential: Moderate

Contrasting Inclusions

Hutton Variant clay loam (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Border and corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIs, irrigated and nonirrigated

52-Justesen loam, 2 to 4 percent slopes

Composition

Justesen loam, 2 to 4 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Justesen Soil

Position on landscape: Fan terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 2 inches-brown loam
2 to 7 inches-yellowish brown loam
7 to 15 inches-brown clay loam
15 to 24 inches-pale brown loam
24 to 42 inches-light brownish gray and light gray loam
42 to 62 inches-white fine sandy loam

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Manard silt loam in convex areas (5 percent); Goodington silt loam in depressions (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated; IIIc, nonirrigated

53-Justesen loam, 4 to 8 percent slopes

Composition

Justesen loam, 4 to 8 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Justesen Soil

Position on landscape: Fan terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 2 inches-brown loam
2 to 7 inches-yellowish brown loam
7 to 15 inches-brown clay loam
15 to 24 inches-pale brown loam
24 to 42 inches-light brownish gray and light gray loam
42 to 62 inches-white fine sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Medium
Hazard of water erosion: Moderate

Contrasting Inclusions

Goodington silt loam in depressions (5 percent);
Bringmee loam along stream terraces (5 percent)

Major Uses

Cropland, hayland, and pasture
Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland
Dominant vegetation in potential natural plant community:
Basin big sagebrush, bluebunch wheatgrass
Main limitations: Hazard of erosion, slope
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVe, irrigated and nonirrigated

54-Justesen loam, 8 to 12 percent slopes

Composition

Justesen loam, 8 to 12 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Justesen Soil

Position on landscape: Fan terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 14 inches-very dark grayish brown loam
14 to 25 inches-pale brown clay loam
25 to 31 inches-very pale brown silty clay loam
31 to 64 inches-white loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Rapid
Hazard of water erosion: Severe

Contrasting Inclusions

Goodington silt loam in depressions (5 percent);
Elkcreek loam on toe slopes (5 percent)

Major Uses

Cropland, hayland, and pasture
Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture

General management considerations:

- A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland

Dominant vegetation in potential natural plant community:

Basin big sagebrush, bluebunch wheatgrass

Main limitations: Hazard of erosion, slope *General management considerations:*

- Brush management, proper distribution of livestock, and range seeding are needed.
- Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
- Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVe, irrigated; IIIe, nonirrigated

55-Justesen loam, 12 to 30 percent slopes

Composition

Justesen loam, 12 to 30 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Justesen Soil

Position on landscape: Fan terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:

0 to 14 inches-very dark grayish brown loam
14 to 25 inches-pale brown clay loam
25 to 31 inches-very pale brown silty clay loam
31 to 64 inches-white loam

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Elkcreek loam on toe slopes (10 percent); Winu stony loam on toe slopes (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community:

Basin big sagebrush, bluebunch wheatgrass

Main limitations: Hazard of erosion, slope
General management considerations:

- Brush management, proper distribution of livestock, and range seeding are needed.
- Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
- Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVe, irrigated and nonirrigated

56-Ketchum-Dollarhide complex, 30 to 60 percent slopes

Composition

Ketchum very gravelly loam, 30 to 60 percent slopes 55 percent
Dollarhide very gravelly fine sandy loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-15 percent

Characteristics of the Ketchum Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 6,000 to 8,500 feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 38 degrees F
Frost-free period: Less than 60 days
Organic layer on surface: Forest litter 2 inches thick
Typical profile:

0 to 3 inches-brown very gravelly loam
3 to 32 inches-pale brown and light gray very gravelly fine sandy loam

32 to 48 inches-light yellowish brown and very pale brown very gravelly sandy loam
48 to 61 inches-light gray extremely gravelly coarse sandy loam

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Low
Potential rooting depth: 60 inches or more
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Dollarhide Soil

Position on landscape: Ridges
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 6,000 to 8,500 feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 7 inches-brown very gravelly fine sandy loam
7 to 13 inches-yellowish brown extremely cobbly fine sandy loam
13 inches-fractured quartzite

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Povey gravelly loam on open north- and east-facing slopes (10 percent); Rock outcrop on ridges (5 percent)

Major Uses

Woodland
(Ketchum Soil)

Dominant vegetation in potential natural plant community:
Douglas fir, mountain snowberry

Average site index for Douglas fir (50-year site curve): 50
Maximum average annual growth for Douglas fir: 68 cubic feet per acre from a stand of trees 45 years old
Main limitations: Hazard of erosion, slope, low available water capacity, hazard of windthrow

Grazable understory
(Ketchum Soil)

Common forest understory plants: Elk sedge, heartleaf arnica, pine reedgrass, mountain snowberry

General management considerations:
• Where the canopy cover is more than 40 percent, the understory is sparse and has low value as forage. Where the canopy is less dense, the understory provides good forage.
• Forage production can be increased by seeding disturbed areas to suitable plants and deferring grazing until seedlings are well established.

Rangeland
(Dollarhide Soil)

Dominant vegetation in potential natural plant community:
Mountain big sagebrush, Idaho fescue

General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope and the hazard of erosion.
• Range seeding is not suitable on this soil because of the slope, the very low available water capacity, and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

57-Ketchum-Povey complex, 30 to 60 percent slopes

Composition

Ketchum very gravelly loam, 30 to 60 percent slopes *50* percent
Povey gravelly loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Ketchum Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 6,000 to 8,500 feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 38 degrees F
Frost-free period: Less than 60 days
Organic layer on surface: Forest litter 2 inches thick
Typical profile:
0 to 3 inches-brown very gravelly loam
3 to 32 inches-pale brown and light gray very gravelly fine sandy loam

32 to 42 inches-very pale brown very gravelly sandy loam
42 to 48 inches-light yellowish brown very gravelly sandy loam
48 to 61 inches-light gray extremely gravelly coarse sandy loam

Depth class. Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Low
Potential rooting depth: 60 inches or more
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Povey Soil

Position on landscape: Open areas on north- and east-facing mountainsides
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 6,000 to 8,500 feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 38 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 4 inches-dark grayish brown and brown gravelly loam
4 to 25 inches-brown very gravelly loam
25 to 50 inches-brown extremely cobbly loam
50 inches-quartzitic sandstone

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Dollarhide very gravelly fine sandy loam on ridges (10 percent); Vitale very gravelly loam on south- and west-facing slopes (5 percent); Rock outcrop on ridges (5 percent)

Major Uses

Woodland
(Ketchum soil)

Dominant vegetation in potential natural plant community:
Douglas fir, mountain snowberry
Average site index for Douglas fir (50-year site curve): 50
Maximum average annual growth for Douglas fir: 68 cubic feet per acre from a stand of trees 45 years old
Main limitations: Hazard of erosion, slope, low available water capacity, hazard of windthrow

Grazable understory
(Ketchum soil)

Common forest understory plants: Elk sedge, heartleaf arnica, pine reedgrass, mountain snowberry
General management considerations
• Where the canopy cover is more than 40 percent, the understory is sparse and has low value as forage. Where the overstory is less dense, the understory provides good forage.
• Forage production can be increased by seeding disturbed areas to suitable plants and deferring grazing until seedlings are well established.

Rangeland
(Povey soil)

Dominant vegetation in potential natural plant community: Mountain big sagebrush, mountain snowberry, Idaho fescue
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope and the hazard of erosion.
• Range seeding is not suitable on this soil because of the slope, the low available water capacity, and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope.

Capability Classification

VIIe, nonirrigated

58-Laurentzen-Mulshoe complex, 4 to 30 percent slopes

Composition

Laurentzen silt loam, 4 to 12 percent slopes-50 percent
Mulshoe very stony loam, 4 to 30 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Laurentzen Soil

Position on landscape: Depressions and swales on foothills
Parent material: Alluvium derived from basalt
Elevation: 5,000 to 6,000 feet

Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 13 inches-dark brown silt loam
13 to 26 inches-dark brown clay loam
26 to 63 inches-yellowish brown clay loam
63 inches-basalt
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Mulshoe Soil

Position on landscape: Concave areas on foothills
Parent material. Residuum and colluvium derived from basalt
Elevation: 5,000 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 10 inches-brown very stony loam
10 to 23 inches-yellowish brown very stony clay loam
23 to 28 inches-very pale brown, weathered basalt that has yellowish brown clay loam in the cracks
28 inches-hard basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Very low
Potential rooting depth: 20 to 40 inches
Runoff: Rapid or very rapid
Hazard of water erosion: Severe or very severe

Contrasting Inclusions

Elkcreek loam on concave side slopes (10 percent); Polecreek very stony loam in eroded areas (5 percent); Rock outcrop on all aspects (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Mountain big sagebrush, Idaho fescue
Main limitations: Very stony loam upper layer in the Mulshoe soil, hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the very stony loam upper layer in the Mulshoe soil.
• Range seeding is suitable on the Laurentzen soil. Drilling is the best suited method.

Capability Classification

VIs, nonirrigated

59-Lava flows

Location in survey area: Craters of the Moon National Monument
Slope range: 2 to 15 percent
Kind of material: Barren basalt associated with recent volcanic activity
Common features: Pressure ridges, fissures, sinkholes
Major use: Wildlife habitat for small rodents, rabbits, marmots, bobcats, sage grouse, hawks, and falcons
Capability classification: VIIs, nonirrigated

60-Lava flows-Cinderhurst complex, 2 to 15 percent slopes

Composition

Lava flows-75 percent
Cinderhurst extremely cobbly silt loam, 2 to 15 percent slopes-20 percent
Contrasting inclusions-5 percent

Characteristics of the Lava Flows

Location in survey area: Craters of the Moon National Monument
Kind of material: Barren basalt associated with recent volcanic activity
Common features: Pressure ridges, fissures, sinkholes

Characteristics of the Cinderhurst Soil

Position on landscape: Depressions on basalt plains
Parent material: Volcanic tephra
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 3 inches-brown extremely cobbly silt loam
3 to 8 inches-yellowish brown very cobbly silt loam
8 inches-basalt that has vertical fractures 2 to 5 centimeters wide

Depth class: Very shallow
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Potential rooting depth: 4 to 10 inches
Runoff: Very slow
Hazard of water erosion: Slight

Contrasting Inclusions

Soils that are similar to the Cinderhurst soil but are 20 to 40 inches deep (5 percent)

Major Use

Wildlife habitat
Dominant vegetation in potential natural plant community: Big sagebrush, lava fernbush, antelope bitterbrush, Nevada bluegrass (fig. 9)
Common wildlife species: Small rodents, rabbits, marmots, bobcats, sage grouse, hawks, falcons

Capability Classification

VIIs, nonirrigated

61-Lavacreek-Dollarhide very gravelly silt loams, 30 to 60 percent slopes

Composition

Lavacreek very gravelly silt loam, 30 to 60 percent slopes-65 percent
Dollarhide very gravelly silt loam, 30 to 60 percent slopes-20 percent
Contrasting inclusions-15 percent

Characteristics of the Lavacreek Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Volcanic-tephra-influenced colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,500 to *8,500* feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 4 inches-dark brown very gravelly silt loam
4 to 23 inches-brown very gravelly silt loam
23 to 36 inches-dark yellowish brown very cobbly loam
36 to 41 inches-yellowish brown extremely cobbly loam
41 to 49 inches-very pale brown extremely cobbly sandy loam
49 inches-fractured quartzitic sandstone
Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Dollarhide Soil

Position on landscape: Ridges on mountainsides
Parent material: Volcanic-tephra-influenced colluvium derived from quartzitic sandstone and conglomerate
Elevation: 5,500 to *8,500* feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 7 inches-brown very gravelly silt loam
7 to 11 inches-light yellowish brown very gravelly silt loam
11 to 16 inches-yellowish brown extremely cobbly loam
16 inches-quartzitic sandstone
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Restriction affecting rooting depth: Bedrock at a depth of 16 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Ketchum very gravelly loam on forested north- and east-facing slopes *(5* percent); Vitale very gravelly loam on south- and west-facing slopes *(5* percent); Rock outcrop (5 percent) in concave areas

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Lavacreek soil-mountain big sagebrush, Idaho fescue; Dollarhide soil-hot springs sagebrush, Idaho fescue
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.

Figure 9.-Typical area of Lava flows-Cinderhurst complex, 2 to 15 percent slopes.

• Fences and stock water pipelines are limited by the slope and by the depth to bedrock in the Dollarhide soil.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

62-Lavacreek-Dollarhide very gravelly silt loams, cold, 15 to 60 percent slopes

Composition

Lavacreek very gravelly silt loam, cold, 15 to 60 percent slopes-65 percent
Dollarhide very gravelly silt loam, cold, 15 to 60 percent slopes-25 percent
Contrasting inclusions-10 percent

Characteristics of the Lavacreek Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Volcanic-tephra-influenced colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 7,000 to 9,250 feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 39 degrees F
Frost-free period: About 30 days
Typical profile:
0 to 9 inches-grayish brown *very* gravelly silt loam
9 to 18 inches-brown very gravelly silt loam
18 to 38 inches-yellowish brown very gravelly loam
38 to 43 inches-very pale brown extremely cobbly sandy loam
43 inches-fractured quartzitic sandstone

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Medium to very rapid
Hazard of water erosion: Severe or very severe

Characteristics of the Dollarhide Soil

Position on landscape: Ridges
Parent material: Volcanic-tephra-influenced colluvium derived dominantly from quartzitic sandstone and conglomerate
Elevation: 7,000 to 9,250 feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 39 degrees F
Frost-free period: About 30 days
Typical profile:
0 to 7 inches-brown very gravelly silt loam
7 to 11 inches-light yellowish brown very gravelly silt loam
11 to 16 inches-yellowish brown extremely cobbly loam
16 inches-quartzitic sandstone
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Restriction affecting rooting depth: Bedrock at a depth of 16 inches
Runoff: Medium to very rapid
Hazard of water erosion: Severe or very severe

Contrasting inclusions

Blackspar very cobbly loam on south- and west-facing slopes (5 percent); Vitale very gravelly loam on south- and west-facing slopes (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Lavacreek soil-subalpine big sagebrush, Idaho fescue; Dollarhide soil-hot springs sagebrush, Idaho fescue
Main limitation: Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. In areas that have slopes of more than 30 percent, however, brush control is limited to chemical spraying.
• Range seeding is suitable in areas that have slopes of less than 30 percent. Drilling is the best suited method.
• Fences and stock water pipelines are limited by the slope, the depth to bedrock in the Dollarhide soil, and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

63-Lavacreek-Vitale association, 30 to 60 percent slopes

Composition

Lavacreek very gravelly silt loam, 30 to 60 percent slopes-45 percent
Vitale very gravelly loam, 30 to 60 percent slopes-35 percent
Contrasting inclusions--20 percent

Characteristics of the Lavacreek Soil

Position on landscape: North- and east-facing mountainsides at elevations below 7,500 feet; all aspects of mountainsides at elevations above 7,500 feet
Parent material: Volcanic-tephra-influenced colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,300 to 9,000 feet
Average annual precipitation: About 20 inches
Average annual air temperature: About 38 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 4 inches-dark brown very gravelly silt loam
4 to 23 inches-brown very gravelly silt loam
23 to 36 inches-dark yellowish brown very cobbly loam
36 to 41 inches-yellowish brown extremely cobbly loam
41 to 49 inches-very pale brown extremely cobbly sandy loam
49 inches-fractured quartzitic sandstone
Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Vitale Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Residuum and colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,300 to 9,000 feet
Average annual precipitation: About 16 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 6 inches-dark grayish brown very gravelly loam
6 to 15 inches-brown very gravelly clay loam
15 to 23 inches-light brownish gray very gravelly loam
23 inches-quartzitic sandstone
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Restriction affecting rooting depth: Bedrock at a depth of 23 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Dollarhide very gravelly silt loam on north- and eastfacing slopes (10 percent); Blackspar very cobbly loam on south- and west-facing slopes (5 percent); Rock outcrop on ridges (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Lavacreek soil-mountain big sagebrush, Idaho fescue; Vitale soil-mountain big sagebrush, bluebunch wheatgrass
General management considerations.
- Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope and by the depth to bedrock in the Vitale soil.

Capability Classification

VIIe, nonirrigated

64-Little Wood gravelly loam, 0 to 2 percent slopes

Composition

Little Wood gravelly loam, 0 to 2 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Little Wood Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 5,300 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 8 inches-dark brown gravelly loam
8 to 13 inches-brown gravelly loam
13 to 26 inches-brown and yellowish brown very gravelly sandy clay loam
26 to 32 inches-yellowish brown extremely gravelly coarse sandy loam
32 to 42 inches-brown extremely gravelly loamy coarse sand
42 to 61 inches-pale brown extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 26 inches; rapid or very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 32 inches
Runoff: Very slow
Hazard of water erosion: Slight
Shrink-swell potential: Moderate

Contrasting Inclusions

Bringmee loam in concave areas (5 percent); Bruneel loam in drainageways (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and

applications of fertilizer improve the quality of forage on pastures.

• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.

• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIc, irrigated and nonirrigated

65-Little Wood gravelly loam, 2 to 4 percent slopes

Composition

Little Wood gravelly loam, 2 to 4 percent slopes-95 percent
Contrasting inclusions--5 percent

Characteristics of the Little Wood Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 5,300 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 8 inches-dark brown gravelly loam 8 to 13 inches-brown gravelly loam
13 to 26 inches-brown and yellowish brown very gravelly sandy clay loam
26 to 32 inches-yellowish brown extremely gravelly coarse sandy loam
32 to 42 inches-brown extremely gravelly loamy coarse sand
42 to 61 inches-pale brown extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 26 inches; rapid or very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 32 inches
Runoff: Slow
Hazard of water erosion: Slight
Shrink-swell potential: Moderate

Contrasting Inclusions

Bringmee loam in concave areas (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:

• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.

• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.

• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.

• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated; IIIc, nonirrigated

66-Little Wood very gravelly loam, 0 to 2 percent slopes

Composition

Little Wood very gravelly loam, 0 to 2 percent slopes90 percent
Contrasting inclusions-10 percent

Characteristics of the Little Wood Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 5,300 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 10 inches-grayish brown very gravelly loam
10 to 21 inches-yellowish brown and brown very gravelly sandy clay loam
21 to 25 inches-yellowish brown very gravelly loam
25 to 35 inches-brown extremely gravelly loamy coarse sand
35 to 61 inches-pale brown extremely gravelly coarse sand

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 25 inches; rapid or very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 25 inches
Runoff: Very slow
Hazard of water erosion: Slight
Shrink-swell potential: Moderate

Contrasting Inclusions

Bringmee gravelly loam in convex areas (5 percent); Adamson fine sandy loam in concave areas (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay (fig. 10), pasture
General management considerations:

- A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVs, irrigated and nonirrigated

67-Little Wood very gravelly loam, 2 to 4 percent slopes

Composition

Little Wood very gravelly loam, 2 to 4 percent slopes90 percent
Contrasting inclusions-10 percent

Characteristics of the Little Wood Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 5,300 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 10 inches-grayish brown very gravelly loam
10 to 18 inches-yellowish brown and brown very gravelly sandy clay loam
18 to 22 inches-yellowish brown very gravelly loam
22 to 32 inches-brown extremely gravelly loamy coarse sand
32 to *61* inches-pale brown extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 22 inches; rapid or very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 22 inches
Runoff: Slow
Hazard of water erosion: Slight
Shrink-swell potential: Moderate

Contrasting Inclusions

Bringmee gravelly loam in convex areas (5 percent); Adamson fine sandy loam in concave areas (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:

- A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
- Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
- The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
- Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

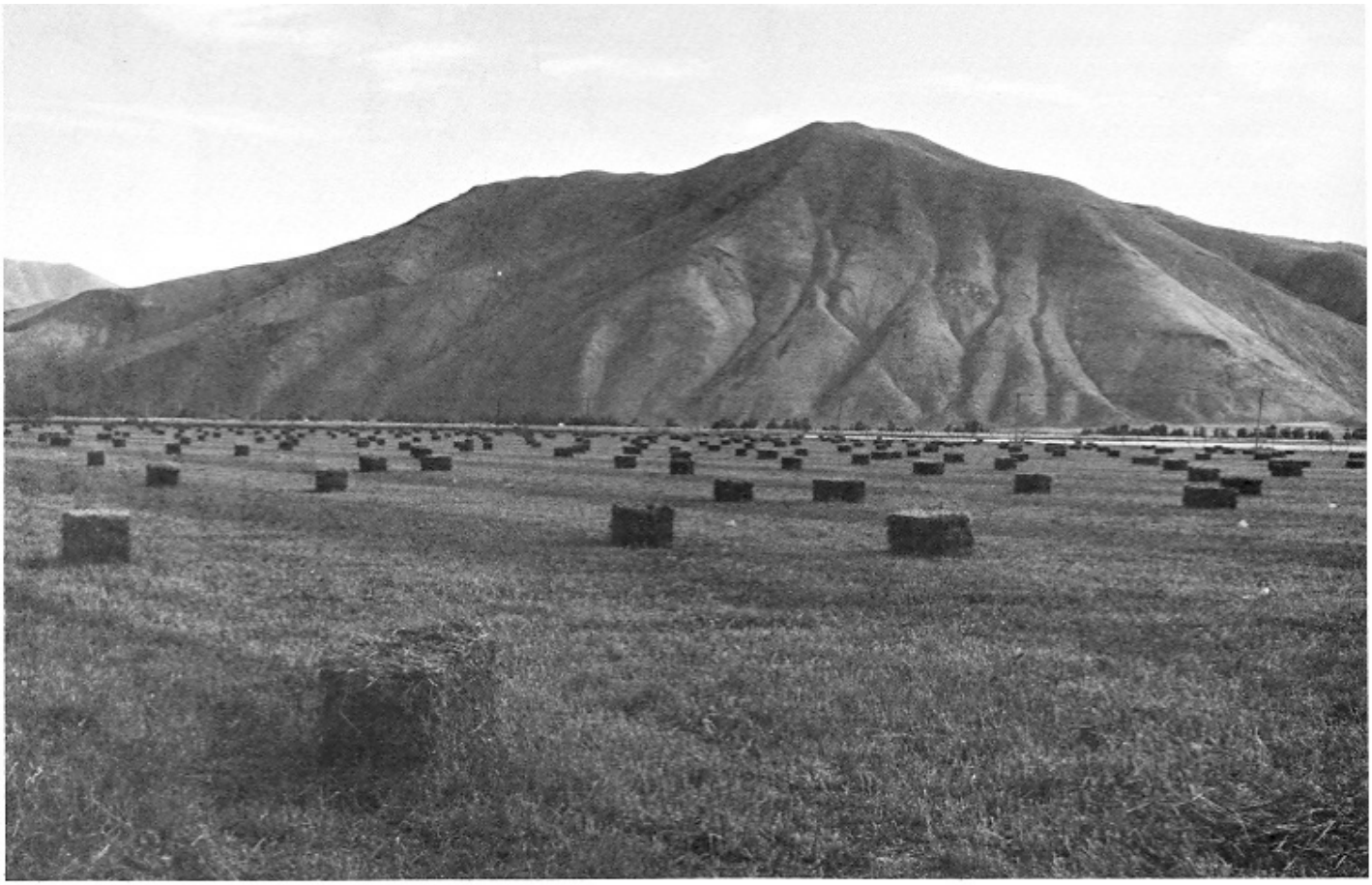

Figure 10. Irrigated alfalfa hay in an area of Little Wood very gravelly loam, 0 to 2 percent slopes. An area of Vitale-Milligan complex, 30 to 60 percent slopes, is in the background.

Rangeland

Dominant vegetation in potential natural plant community: Basin big sagebrush, bluebunch wheatgrass *Main limitation: Low* available water capacity

General management considerations:

- Brush management, proper distribution of livestock, and range seeding are needed.
- Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
- Range seeding is suitable on this unit. Drilling is the best suited method.
- Plants that can tolerate droughtiness are suitable for seeding.

Capability Classification

IVs, irrigated and nonirrigated

68-Little Wood very gravelly loam, cool, 1 to 4 percent slopes

Composition

Little Wood very gravelly loam, cool, 1 to 4 percent slopes-95 percent

Contrasting inclusions-5 percent

Characteristics of the Little Wood Soil

Position on landscape: Stream terraces

Parent material: Mixed alluvium

Elevation: 5,200 to 6,200 feet

Average annual precipitation: About 16 inches

Average annual air temperature: About 40 degrees F

Frost-free period: About 60 days

Typical profile:

0 to 2 inches-very dark grayish brown very gravelly loam

2 to 12 inches-brown very gravelly loam
12 to 16 inches-dark yellowish brown very gravelly sandy clay loam
16 to 24 inches-yellowish brown extremely cobbly sandy clay loam
24 to 31 inches-yellowish brown extremely cobbly sandy loam
31 to 43 inches-yellowish brown extremely cobbly loamy coarse sand
43 to 60 inches-multicolored extremely cobbly coarse sand

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 31 inches; very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and rock fragments at a depth of 31 inches
Runoff: Slow
Hazard of water erosion: Slight
Shrink-swell potential: Moderate

Contrasting Inclusions

Isknat gravelly loam and Balaam gravelly sandy loam (5 percent)

Major Uses

Hayland and pasture
Currently grown irrigated crops: Alfalfa hay, pasture
General management considerations:
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Corrugation systems are also suitable, but their use is restricted by the rapid or very rapid permeability of the included areas.

Capability Classification

IVs, irrigated and nonirrigated

69-Little Wood-Balaam complex, 0 to 2 percent slopes

Composition

Little Wood very gravelly loam, 0 to 2 percent slopes-50 percent
Balaam very gravelly sandy loam, 0 to 2 percent slopes-35 percent
Contrasting inclusions-15 percent

Characteristics of the Little Wood Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,800 to 5,100 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 10 inches-grayish brown very gravelly loam
10 to 21 inches-yellowish brown very gravelly sandy clay loam
21 to 25 inches-yellowish brown very gravelly loam
25 to 35 inches-brown extremely gravelly loamy coarse sand
35 to 61 inches-pale brown extremely gravelly coarse sand

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 25 inches; rapid or very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and gravel at a depth of 25 inches
Runoff: Very slow
Hazard of water erosion: Slight
Shrink-swell potential: Moderate

Characteristics of the Balaam Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,800 to 5,100 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 10 inches-grayish brown very gravelly sandy loam
10 to 24 inches-brown very gravelly sandy loam
24 to 42 inches-pale brown extremely gravelly loamy coarse sand
42 to 63 inches-extremely gravelly coarse sand

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid in the upper 24 inches; very rapid below this depth
Available water capacity: Very low
Potential rooting depth: 60 inches or more
Restriction affecting rooting depth: Loose sand and rock

fragments at a depth of 24 inches
Runoff: Very slow
Hazard of water erosion: Slight
Shrink-swell potential: Low

Contrasting Inclusions

Balaam very cobbly sandy loam (10 percent); Isknat gravelly clay loam (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVs, irrigated and nonirrigated

70-Manard silt loam, 1 to 4 percent slopes

Composition

Manard silt loam, 1 to 4 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Manard Soil

Position on landscape: Basalt plains
Parent material: Residuum derived from basalt
Elevation: 4,700 to 5,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 11 inches-dark brown silt loam
11 to 30 inches-brown clay
30 to 36 inches-pale brown clay
36 to 38 inches-white, indurated duripan
38 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Low
Potential rooting depth: 20 to 37 inches
Restriction affecting rooting depth: Duripan at a depth of 36 inches
Runoff: Slow
Hazard of water erosion: Moderate

Contrasting Inclusions

Goodington silt loam in depressions (5 percent); Manard very stony silt loam in convex areas (5 percent); Gaib very gravelly loam in eroded drainageways (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Rangeland
Dominant vegetation in potential natural plant community.
Alkali sagebrush, Idaho fescue
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are chemical spraying and mechanical treatment. Prescribed burning is limited by the inability of alkali sagebrush to carry fire.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IIIe, irrigated and nonirrigated

71-Marshdale loam, 0 to 2 percent slopes

Composition

Marshdale loam, 0 to 2 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Marshdale Soil

Position on landscape: Flood plains, drainageways
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 9 inches-dark grayish brown loam
9 to 14 inches-dark grayish brown sandy clay loam
14 to 37 inches-light brownish gray sandy clay loam
37 to 52 inches-light brownish gray loam
52 to 62 inches-light gray gravelly coarse sand
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Available water capacity: Moderate
Potential rooting depth: 60 inches or more for water-tolerant plants
Restrictions affecting rooting depth: Loose sand and gravel at a depth of 52 inches, water table at a depth of 6 to 18 inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 6 to 18 inches
Frequency of flooding: Frequent

Contrasting Inclusions

Bruneel loam and Hutton clay loam (15 percent)

Major Uses

Hayland and pasture
Dominant vegetation in potential natural plant community:
Tufted hairgrass, sedges, rushes, willow
Currently grown nonirrigated crops: Pasture, grass hay
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• Wetness limits the choice of plants and the period of cutting or grazing and increases the risk of winterkill.
• Plants that can tolerate wetness are suitable for seeding.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

Capability Classification

Vw, irrigated and nonirrigated

72-Marshdale-Bruneel loams, 0 to 2 percent slopes

Composition

Marshdale loam, 0 to 2 percent slopes-50 percent
Bruneel loam, 0 to 2 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Marshdale Soil

Position on landscape: Flood plains, drainageways
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 27 inches-dark grayish brown loam
27 to 50 inches-light brownish gray loam
50 to 65 inches-light gray gravelly coarse sand
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Available water capacity: Moderate
Potential rooting depth: 60 inches or more for water tolerant plants
Restrictions affecting rooting depth: Loose sand and gravel at a depth of 50 inches, water table at a depth of 6 to 18 inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 6 to 18 inches
Frequency of flooding: Frequent

Characteristics of the Bruneel Soil

Position on landscape: Flood plains
Parent material. Recent alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 14 inches-grayish brown loam
14 to 23 inches-light gray loam

23 to 27 inches-grayish brown very gravelly loamy sand
27 to 61 inches-multicolored extremely gravelly coarse sand
Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate in the upper 23 inches; very rapid below this depth
Available water capacity: Low
Potential rooting depth: 60 inches or more for water-tolerant plants
Restrictions affecting rooting depth: Loose sand and gravel at a depth of 27 inches, water table at a depth of 12 to 18 inches
Runoff: Very slow
Hazard of water erosion: None
Depth to water table: 12 to 18 inches
Frequency of flooding: Occasional

Contrasting Inclusions

Little Wood gravelly loam on stream terraces (10 percent); Bruneel gravelly loam (5 percent); Riverwash (5 percent)

Major Uses

Hayland and pasture
Dominant vegetation in potential natural plant community:
Tufted hairgrass, sedges, rushes, willows *Currently grown nonirrigated crops:* Pasture, grass legume hay
General management considerations:
• Proper grazing practices, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.
• Wetness limits the choice of plants and the period of cutting or grazing and increases the risk of winterkill. - Plants that can tolerate wetness are suitable for seeding.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

Capability Classification

Vw, irrigated and nonirrigated

73-McBiggam silt loam, 2 to 8 percent slopes

Composition

McBiggam silt loam, 2 to 8 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the McBiggam Soil

Position on landscape: Basalt plains
Parent material: Loess over residuum
Elevation: 5,300 to 5,600 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 10 inches-very dark grayish brown and dark brown silt loam
10 to 26 inches-dark brown and light yellowish brown silty clay loam
26 to 46 inches-brown silty clay
46 to 80 inches-brown silty clay loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow or medium
Hazard of water erosion: Moderate or severe

Contrasting Inclusions

McCarey loam on convex ridges and Molyneux loam in drainageways (10 percent)

Major Uses

Current use: Rangeland
Potential uses: Cropland, hayland, pasture

Rangeland
Dominant vegetation in potential natural plant community:
Mountain big sagebrush, Idaho fescue
Main limitation: Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Cropland, hayland, and pasture
Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and

applications of fertilizer improve the quality of forage on pastures.

• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are suitable in areas that have slopes of less than 4 percent.

• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVe, irrigated; IIIe, nonirrigated

74-McCarey-Justesen loams, 2 to 8 percent slopes

Composition

McCarey loam, 2 to 8 percent slopes-50 percent
Justesen loam, 2 to 8 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the McCarey Soil

Position on landscape: Convex tops and side slopes of basalt plains
Parent material: Loess over residuum
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 11 inches-brown loam
11 to 18 inches-brown clay loam
18 to 23 inches-pale brown silt loam
23 to 28 inches-white silt loam
28 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Moderate
Potential rooting depth: 20 to 40 inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Characteristics of the Justesen Soil

Position on landscape: Drainageways and concave areas on basalt plains
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 14 inches-very dark grayish brown loam
14 to 25 inches-pale brown clay loam
25 to 31 inches-very pale brown silty clay loam
31 to 64 inches-white loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Contrasting Inclusions

Soils that are similar to the McCarey soil but are 10 to 20 inches deep, have a very stony upper layer, and are on ridges (10 percent); Rock outcrop (10 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
McCarey soil-threetip sagebrush, bluebunch wheatgrass; Justesen soil-basin big sagebrush, bluebunch wheatgrass
Main limitation: Hazard of erosion
General management considerations:

• Brush management, proper distribution of livestock, and range seeding are needed.

• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. On the McCarey soil, prescribed burning and mechanical treatment are limited by the inherent ability of threetip sagebrush to sprout from its roots and by the hazard of erosion.

• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IIIe, irrigated and nonirrigated

75-McCarey-Justesen-Rock outcrop complex, 2 to 15 percent slopes

Composition

McCarey loam, 2 to 15 percent slopes-40 percent
Justesen loam, 2 to 8 percent slopes-30 percent

Rock outcrop-20 percent
Contrasting inclusions-10 percent

Characteristics of the McCarey Soil

Position on landscape: Convex tops and side slopes of basalt plains
Parent material: Loess over residuum
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 11 inches-brown loam
11 to 18 inches-brown clay loam
18 to 23 inches-pale brown silt loam
23 to 28 inches-white silt loam
28 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Moderate
Potential rooting depth: 20 to 40 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Justesen Soil

Position on landscape: Drainageways and concave areas on basalt plains
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 14 inches-very dark grayish brown loam
14 to 25 inches-pale brown clay loam
25 to 31 inches-very pale brown silty clay loam
31 to 64 inches-white loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff Slow or medium
Hazard of water erosion: Slight or moderate

Characteristics of the Rock Outcrop

Kind of rock: Exposed basalt

Contrasting Inclusions

Soils that are similar to the McCarey soil but are 10 to 20 inches deep to bedrock, have a very stony upper layer, and are on convex side slopes (5 percent); soils that are similar to the Justesen soil but are 40 to 60 inches deep to bedrock and are on concave side slopes (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
McCarey soil-threetip sagebrush, bluebunch wheatgrass; Justesen soil-basin big sagebrush, bluebunch wheatgrass
Main limitations: Areas of Rock outcrop, hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. On the McCarey soil, prescribed burning and mechanical treatment are limited by the inherent ability of threetip sagebrush to sprout from its roots and by the hazard of erosion.
• Range seeding is suitable on this unit. Drilling *is* the best suited method.

Capability Classification

IVe, irrigated; IIIe, nonirrigated

76-McCarey-Molyneux loams, 2 to 8 percent slopes

Composition

McCarey loam, 2 to 8 percent slopes-45 percent
Molyneux loam, 2 to 8 percent slopes-30 percent
Contrasting inclusions-25 percent

Characteristics of the McCarey Soil

Position on landscape: Side slopes of basalt plains
Parent material: Loess over residuum derived from basalt
Elevation: 4,800 to 5,400 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 10 inches-dark grayish brown and dark brown loam
10 to 22 inches-yellowish brown clay loam
22 to 25 inches-very pale brown loam
25 to 37 inches-white silt loam
37 inches-basalt

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Moderate
Potential rooting depth: 20 to 40 inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Characteristics of the Molyneux Soil

Position on landscape: Drainageways on basalt plains
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 5,400 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 8 inches-dark grayish brown loam
8 to 13 inches-brown loam
13 to 50 inches-yellowish brown clay loam
50 to 75 inches-yellowish brown gravelly sandy clay loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Contrasting Inclusions

Pedleford very stony loam in convex areas (10 percent); Bancroft silt loam on toe slopes (10 percent); Rock outcrop in convex areas and on playas in depressions (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: McCarey soil-threetip sagebrush, bluebunch wheatgrass; Molyneux soil-threetip sagebrush, Idaho fescue
Main limitation: Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Prescribed burning and mechanical treatment are limited by the inherent ability of threetip sagebrush to sprout from its roots.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IIIe, irrigated and nonirrigated

77-McCarey-Pedleford complex, 2 to 30 percent slopes

Composition

McCarey loam, 2 to 30 percent slopes-50 percent
Pedleford very stony loam, 2 to 30 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the McCarey Soil

Position on landscape: Concave areas on sides of buttes and basalt plains
Parent material: Loess over residuum derived from basalt
Elevation: 4,800 to 5,400 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 10 inches-dark brown and dark grayish brown loam
10 to 22 inches-yellowish brown clay loam
22 to 25 inches-very pale brown loam
25 to 37 inches-white silt loam
37 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Moderate
Potential rooting depth: 20 to 40 inches
Runoff: Medium to very rapid
Hazard of water erosion: Moderate to very severe

Characteristics of the Pedleford Soil

Position on landscape: Convex areas on sides of buttes and basalt plains
Parent material: Alluvium derived from loess and eolian material over basalt
Elevation: 4,800 to 5,400 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 5 inches-grayish brown very stony loam
5 to 13 inches-brown very stony loam

13 to 29 inches-very pale brown very stony silt loam
29 to 33 inches-very pale brown very cobbly loam
33 inches-basalt

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Potential rooting depth: 20 to 40 inches
Runoff: Slow to rapid
Hazard of water erosion: Slight to severe

Contrasting Inclusions

Molyneux loam in drainageways (10 percent); Bancroft silt loam in drainageways (5 percent); Rock outcrop on ridges and convex side slopes and on playas in depressions (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: McCarey soil-Wyoming big sagebrush, bluebunch wheatgrass; Pedleford soil-basin big sagebrush, bluebunch wheatgrass

Main limitations: Very stony loam upper layer in the Pedleford soil, hazard of erosion, areas of Rock outcrop

General management considerations:

• Brush management, proper distribution of livestock, and range seeding are needed.

• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the very stony loam upper layer in the Pedleford soil and by the hazard of erosion.

• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

VIs, nonirrigated

78-Molyneux loam, 2 to 4 percent slopes

Composition

Molyneux loam, 2 to 4 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Molyneux Soil

Position on landscape: Fan terraces
Parent material: Mixed alluvium
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to *12* inches-grayish brown loam
12 to 35 inches-brown clay loam
35 to 61 inches-dark yellowish brown clay loam

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Bringmee loam (5 percent); Hutton clay loam in drainageways (5 percent); Molyneux loam that has slopes of less than 2 percent (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture

General management considerations:

• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.

• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.

• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are also suitable.

• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated; IIIc, nonirrigated

79-Molyneux loam, 4 to 8 percent slopes

Composition

Molyneux loam, 4 to 8 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Molyneux Soil

Position on landscape: Fan terraces
Parent material: Mixed alluvium
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 80 days
Typical profile:
0 to 12 inches-grayish brown loam
12 to 35 inches-brown clay loam
35 to 61 inches-dark yellowish brown clay loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Medium
Hazard of water erosion: Moderate

Contrasting Inclusions

Bringmee loam (5 percent); Hutton clay loam in depressions (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated and nonirrigated

80-Molyneux loam, cool, 2 to 15 percent slopes

Composition

Molyneux loam, cool, 2 to 15 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Molyneux Soil

Position on landscape: Fan terraces
Parent material: Alluvium derived from various kinds of rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period.' About 75 days
Typical profile:
0 to 13 inches-dark grayish brown and brown loam
13 to 50 inches-yellowish brown clay loam
50 to 75 inches-yellowish brown gravelly sandy clay loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow to rapid
Hazard of water erosion: Slight to severe

Contrasting Inclusions

Drage very gravelly loam in convex areas (10 percent); Little Wood very gravelly loam on stream terraces (5 percent)

Major Uses

Current use: Rangeland
Potential uses: Hayland, pasture

Rangeland

Dominant vegetation in potential natural plant community: Mountain big sagebrush, Idaho fescue
Main limitation: Hazard of erosion *General management considerations:*
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are

prescribed burning, chemical spraying, and mechanical treatment.

• Range seeding is suitable on this unit. Drilling is the best suited method.

Hayland and pasture

Currently grown irrigated crops: Alfalfa hay, pasture

General management considerations:

• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.

• The best suited method of irrigation is a sprinkler system. Corrugation systems are suitable in areas that have slopes of less than 4 percent.

• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IVe, irrigated; IIIe, nonirrigated

81-Moonstone-Bauscher complex, 8 to 30 percent slopes

Composition

Moonstone gravelly coarse sandy loam, 8 to 30 percent slopes-50 percent

Bauscher loam, 8 to 15 percent slopes-30 percent

Contrasting inclusions-20 percent

Characteristics of the Moonstone Soil

Position on landscape: South- and west-facing foothills

Parent material: Colluvium and residuum derived from granite

Elevation: 4,800 to 6,000 feet

Average annual precipitation: About 14 inches

Average annual air temperature: About 41 degrees F

Frost-free period: About 75 days

Typical profile:

0 to 26 inches-dark grayish brown and brown gravelly coarse sandy loam

26 to 34 inches-pale brown gravelly coarse sandy loam

34 inches-weathered granitic bedrock

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderately rapid

Available water capacity: Low

Potential rooting depth: 20 to 40 inches

Runoff: Rapid or very rapid

Hazard of water erosion: Severe or very severe

Characteristics of the Bauscher Loam

Position on landscape: Concave areas, depressions, and toe slopes of foothills

Parent material: Alluvium and colluvium derived from granite

Elevation: 4,800 to 6,000 feet

Average annual precipitation: About 14 inches

Average annual air temperature: About 41 degrees F

Frost-free period: About 75 days

Typical profile:

0 to 14 inches-dark grayish brown and dark brown loam

14 to 37 inches-brown and yellowish brown sandy clay loam

37 to 42 inches-light yellowish brown coarse sandy loam

42 inches-weathered granitic bedrock

Depth class: Deep

Drainage class. Well drained

Permeability: Moderately slow

Available water capacity: Moderate

Potential rooting depth: 40 to 60 inches

Runoff: Rapid

Hazard of water erosion: Severe

Contrasting Inclusions

Soils that are similar to the Moonstone soil but are 10 to 20 inches deep to bedrock and are on ridges (10 percent); Earcree gravelly coarse sandy loam on north- and east-facing slopes (10 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community:

Mountain big sagebrush, Idaho fescue

Main limitation: Hazard of erosion

General management considerations:

• Brush management, proper distribution of livestock, and range seeding are needed.

• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.

• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVe, nonirrigated

82-Moonstone-Earcree association, 30 to 60 percent slopes

Composition

Moonstone gravelly coarse sandy loam, 30 to 60 percent slopes-50 percent
Earcree gravelly coarse sandy loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Moonstone Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Colluvium and residuum derived from granite
Elevation: 5,000 to 7,800 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 21 inches-dark grayish brown and brown gravelly coarse sandy loam
21 to 32 inches-grayish brown gravelly coarse sandy loam
32 inches-granitic bedrock
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Earcree Soil

Position on landscape: North- and east-facing mountainsides at elevations below 7,500 feet; all aspects of mountainsides at elevations above 7,500 feet
Parent material: Colluvium and slope alluvium over residuum
Elevation: 5,000 to 7,800 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 37 inches-dark grayish brown and brown gravelly coarse sandy loam
37 to 52 inches-pale brown gravelly coarse sandy loam
52 to 70 inches-pale brown very gravelly loamy coarse sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Potential rooting depth: 60 inches or more
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Bauscher loam on fan terraces (10 percent); soils that are similar to the Earcree soil but receive supplemental moisture in the lower part of the profile from springs and support quaking aspen (5 percent); soils that are less than 20 inches deep to bedrock and Rock outcrop (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Moonstone soil-mountain big sagebrush, bluebunch wheatgrass; Earcree soil-mountain big sagebrush, Idaho fescue *General management considerations:*
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope and the hazard of erosion.
• Range seeding generally is not suitable on this unit because of the slope and the hazard of erosion; however, it is suited to some gently sloping areas of the included Bauscher loam. Drilling is the best suited method.
• Fences and stock water pipelines are limited by the slope.

Capability Classification

VIIe, nonirrigated

83-Muldoon-Peevywell loams, 2 to 15 percent slopes

Composition

Muldoon loam, 2 to 15 percent slopes-60 percent
Peevywell loam, 2 to 15 percent slopes-30 percent
Contrasting inclusions-10 percent

Characteristics of the Muldoon Soil

Position on landscape: Convex areas on fan terraces
Parent material: Alluvium derived from mixed igneous and metamorphic rock
Elevation: 4,800 to 6,500 feet

Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 7 inches-brown loam
7 to 45 inches-yellowish brown clay loam
45 inches-light yellowish brown, indurated duripan
Depth class: Deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Moderate
Potential rooting depth: 40 to 60 inches
Restriction affecting rooting depth: Duripan at a depth of 45 inches
Runoff: Medium
Hazard of water erosion: Moderate

Characteristics of the Peevywell Soil

Position on landscape: Eroded areas and drainageways on fan terraces
Parent material: Alluvium derived from mixed igneous and metamorphic rock
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 12 inches-brown loam
12 to 22 inches-yellowish brown and brown clay loam
22 to 30 inches-brown clay
30 to 44 inches-light brown, indurated duripan
44 to 61 inches-yellowish brown very gravelly sandy loam
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 24 to 35 inches
Restriction affecting rooting depth: Duripan at a depth of 30 inches
Runoff: Slow to rapid
Hazard of water erosion: Slight to severe

Contrasting Inclusions

Hutton clay loam in depressions and drainageways (10 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community.
Muldoon soil-mountain big sagebrush, bluebunch wheatgrass; Peevywell soil-alkali sagebrush, Idaho fescue
Main limitation: Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVs, nonirrigated

84-Mulshoe-Gaib-Rock outcrop complex, 4 to 30 percent slopes

Composition

Mulshoe very stony loam, 4 to 30 percent slopes-50 percent
Gaib stony loam, 4 to 30 percent slopes-25 percent
Rock outcrop-20 percent Contrasting inclusions-5 percent

Characteristics of the Mulshoe Soil

Position on landscape: Concave areas on south- and west-facing foothills
Parent material: Residuum and colluvium derived from basalt
Elevation: 4,800 to 7,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 10 inches-brown very stony loam
10 to 23 inches-yellowish brown very stony clay loam
23 to 28 inches-very pale brown, weathered basalt that has yellowish brown clay loam in the cracks
28 inches-hard basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Very low
Potential rooting depth: 20 to 40 inches
Runoff: Slow to rapid
Hazard of water erosion: Slight to severe

Characteristics of the Gaib Soil

Position on landscape: Convex areas on south- and west-facing foothills

Parent material: Residuum derived from andesite, latite, and basalt
Elevation: 4,800 to 7,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 4 inches-brown stony loam
4 to 12 inches-dark yellowish brown very cobbly clay loam
12 inches-basalt
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Medium to very rapid
Hazard of water erosion: Moderate to very severe

Characteristics of the Rock Outcrop

Position on landscape: Convex areas, ridgetops
Kind of material: Exposed basalt

Contrasting Inclusions

Winu stony loam on north- and east-facing slopes (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Mulshoe soil-mountain big sagebrush, Idaho fescue; Gaib soil-low sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the very stony and stony upper layer in the Mulshoe and Gaib soils and by the hazard of erosion. Prescribed burning is limited on the Gaib soil by the inability of low sagebrush to carry fire.
• Range seeding is not suitable on this unit because of the very stony and stony upper layer in the Mulshoe and Gaib soils.

Capability Classification

Vls, nonirrigated

85-Mulshoe-Gaib-Winu complex, 30 to 60 percent slopes

Composition

Mulshoe very cobbly loam, 30 to 60 percent slopes-45 percent
Gaib very gravelly loam, 30 to 60 percent slopes-30 percent
Winu stony loam, 30 to 60 percent slopes-20 percent
Contrasting inclusions-5 percent

Characteristics of the Mulshoe Soil

Position on landscape: Concave areas on south- and west-facing mountainsides
Parent material: Residuum and colluvium derived from basalt
Elevation: 5,500 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 12 inches-brown very cobbly loam
12 to 21 inches-dark yellowish brown very cobbly clay loam
21 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Very low
Potential rooting depth: 20 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Gaib Soil

Position on landscape: Convex areas on south- and west-facing mountainsides
Parent material: Residuum derived from andesite, latite, and basalt
Elevation: 5,500 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 5 inches-brown very gravelly loam
5 to 13 inches-dark yellowish brown very cobbly clay loam
13 inches-basalt
Depth class: Shallow
Drainage class: Well drained

Permeability: Moderately slow
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Winu Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Colluvium derived dominantly from latite, andesite, and basalt
Elevation: 5,500 to 7,500 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 13 inches-dark grayish brown and brown stony loam
13 to 21 inches-brown gravelly loam
21 to 35 inches-yellowish brown gravelly clay loam
35 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 24 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Rock outcrop in convex areas (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Mulshoe and Gaib soils-mountain big sagebrush, bluebunch wheatgrass; Winu soil-mountain big sagebrush, Idaho fescue
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope and the hazard of erosion.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.
• Fences and stock water pipelines are limited by the slope, the hazard of erosion, and the depth to bedrock in the Gaib soil.

Capability Classification

VIIe, nonirrigated

86-Pagari-Rehfield complex, 2 to 15 percent slopes

Composition

Pagari very cobbly sandy loam, 2 to 15 percent slopes-45 percent
Rehfield loamy sand, 2 to 8 percent slopes-30 percent
Contrasting inclusions-25 percent

Characteristics of the Pagari Soil

Position on landscape: Convex ridgetops and side slopes of basalt plains
Parent material: Eolian-influenced alluvium over basalt
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 17 inches-brown and grayish brown very cobbly sandy loam
17 to 31 inches-yellowish brown extremely cobbly loam
31 to 46 inches-pale brown and very pale brown extremely cobbly loam
46 inches-fractured basalt
Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Characteristics of the Rehfield Soil

Position on landscape: Depressions and drainageways on basalt plains
Parent material: Eolian-influenced alluvium derived from various kinds of rock
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 11 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 11 inches-brown loamy sand
11 to 42 inches-yellowish brown sandy loam and sandy clay loam
42 to 67 inches-light yellowish brown loamy sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Potential rooting depth: 60 inches or more

Runoff: Slow
Hazard of water erosion: Slight
Hazard of wind erosion: Severe

Contrasting Inclusions

Rock outcrop in convex areas (15 percent); Cox very stony sandy loam on ridgetops and convex side slopes (10 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Pagari soil-basin big sagebrush, bluebunch wheatgrass; Rehfield soil-basin big sagebrush, needleandthread, Indian ricegrass
Main limitations: Loamy sand upper layer in the Rehfield soil, very cobbly sandy loam upper layer in the Pagari soil, droughtiness, hazard of wind erosion
General management considerations:

- Brush management, proper distribution of livestock, and range seeding are needed.
- Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the very cobbly sandy loam upper layer in the Pagari soil and by the included areas of Rock outcrop.
- Range seeding is suited to this unit. It is limited by the very cobbly sandy loam upper layer in the Pagari soil and by the included areas of Rock outcrop. Drilling is the best suited method.

Capability Classification

VIIs, nonirrigated

87-Peevywell-Simonton loams, 2 to 8 percent slopes

Composition

Peevywell loam, 2 to 8 percent slopes-50 percent
Simonton loam, 2 to 8 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Peevywell Soil

Position on landscape: Convex tops and side slopes on fan terraces
Parent material: Mixed alluvium
Elevation: 4,800 to 5,500 feet
Average annual precipitation: About 13 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 5 inches-brown loam
5 to 10 inches-yellowish brown clay loam
10 to 24 inches-yellowish brown and light yellowish brown clay
24 to 46 inches-pale brown, indurated duripan
46 to 61 inches-pale brown gravelly loamy sand
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 24 to 35 inches
Restriction affecting rooting depth: Duripan at a depth of 24 inches
Runoff: Slow or medium
Hazard of erosion: Slight or moderate

Characteristics of the Simonton Soil

Position on landscape: Drainageways and concave areas on fan terraces
Parent material: Alluvium derived from granite
Elevation: 4,800 to 5,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 12 inches-brown and yellowish brown loam
12 to 52 inches-yellowish brown and light yellowish brown clay loam and sandy clay loam
52 to 64 inches-pale brown sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow or medium
Hazard of erosion: Slight or moderate

Contrasting Inclusions

Manard very stony silt loam in convex areas (10 percent); Marshdale loam on flood plains (10 percent)

Major Uses

Rangeland
Dominant vegetation in potential natural plant community:
Peevywell soil-alkali sagebrush, Idaho fescue; Simonton soil-mountain big sagebrush, Idaho fescue
General management considerations:

- Brush management, proper distribution of livestock,

and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Prescribed burning is limited by the inability of alkali sagebrush to carry fire.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Cropland, hayland, and pasture
Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
Main limitation: Hazard of erosion
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIs, irrigated; IIIe, nonirrigated

88-Peevywell-Simonton complex, 8 to 30 percent slopes

Composition

Peevywell loam, 8 to 30 percent slopes-50 percent
Simonton silt loam, 8 to 15 percent slopes-35 percent
Contrasting inclusions-15 percent

Characteristics of the Peevywell Soil

Position on landscape: Convex and eroded areas on fan terraces
Parent material: Alluvium derived from mixed igneous and metamorphic rock
Elevation: 4,800 to 5,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 12 inches-brown loam
12 to *22* inches-yellowish brown and brown clay loam
22 to 30 inches-brown clay
30 to 44 inches-indurated duripan
44 to 61 inches-yellowish brown very gravelly sandy loam
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 24 to 35 inches
Restriction affecting rooting depth: Duripan at a depth of 30 inches
Runoff: Medium to very rapid
Hazard of water erosion: Severe or very severe

Characteristics of the Simonton Soil

Position on landscape: Concave areas on fan terraces
Parent material: Alluvium derived from granite
Elevation: 4,800 to 5,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 11 inches-brown silt loam
11 to *43* inches-light yellowish brown clay loam
43 to 61 inches-light brown sandy clay loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Contrasting Inclusions

Bauscher loam in depressions and on toe slopes (10 percent); Marshdale loam in drainageways (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Peevywell soil-alkali sagebrush, Idaho fescue; Simonton soil-mountain big sagebrush, Idaho fescue
Main limitations: Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are

prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVe, nonirrigated

89-Picabo silt loam, 0 to 2 percent slopes

Composition

Picabo silt loam, 0 to 2 percent slopes-90 percent
Contrasting inclusions-10 percent

Characteristics of the Picabo Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 9 inches-grayish brown and light brownish gray silt loam
9 to 16 inches-light brownish gray silt loam
16 to 23 inches-light gray loam
23 to 39 inches-light gray silt loam
39 to 51 inches-white gravelly silt loam
51 to 53-white silt loam
53 to 55 inches-gray silt loam
55 to 61 inches-gray very fine sandy loam
61 to 72 inches-dark gray extremely gravelly loamy sand
Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Available water capacity: High
Potential rooting depth: 60 inches or more for water tolerant plants
Restrictions affecting rooting depth: Water table at a depth of 24 to 48 inches, lime concretions at a depth of 36 to 50 inches
Runoff. Very slow
Hazard of water erosion: Slight
Depth to water table: 24 to 48 inches
Frequency of flooding: Occasional

Contrasting Inclusions

Hapur silt loam and Bickett mucky peat in wet areas (5 percent); soils that are similar to the Picabo soil but are 20 to 30 inches deep to lime nodules and are in the higher lying areas (5 percent)

Major Uses

Current uses: Cropland, pasture
Potential uses: Hayland, rangeland

Cropland
Currently grown nonirrigated crops: Wheat, barley, oats
General management considerations. - Providing drainage is difficult because most areas have poor outlets and are subject to seasonal flooding.
• A suitable cropping system, crop residue management, and applications of fertilizer help to maintain fertility and tilth.
• Supplemental irrigation may be needed during the growing season to ensure adequate moisture for crop production.
• The best suited method of irrigation is a sprinkler system.

Hayland and pasture

Dominant vegetation in potential natural plant community: Shrubby cinquefoil, sedges, tufted hairgrass *Currently grown nonirrigated crops:* Grass-legume hay, pasture
General management considerations:
• Providing drainage is difficult because most areas have poor outlets and are subject to seasonal flooding.
• Supplemental irrigation may be needed during the growing season to ensure adequate moisture for crop production.
• The best suited method of irrigation is a sprinkler system.
• Plants that can tolerate wetness are suitable for seeding.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

Capability Classification

IIIw, irrigated and nonirrigated

90-Picabo gravelly loam, 0 to 2 percent slopes

Composition

Picabo gravelly loam, 0 to 2 percent slopes-95 percent
Contrasting inclusions-5 percent

Characteristics of the Picabo Soil

Position on landscape: Stream terraces
Parent material: Mixed alluvium
Elevation: 4,700 to 5,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 43 degrees F

Frost-free period: About 75 days
Typical profile:
0 to 11 inches-very dark brown gravelly loam
11 to 31 inches-light gray and light brownish gray loam
31 to 40 inches-light gray silt loam
40 to 53 inches-white gravelly silt loam
53 to 61 inches-gray very fine sandy loam 61 to 72 inches-dark gray extremely gravelly loamy sand
Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Available water capacity: High
Potential rooting depth: 60 inches or more for water-tolerant plants
Restrictions affecting rooting depth: Water table at a depth of 24 to 48 inches, lime concretions at a depth of 36 to 50 inches
Runoff: Very slow
Hazard of water erosion: Slight
Depth to water table: 24 to 48 inches
Frequency of flooding: Occasional

Contrasting Inclusions

Bruneel loam along streams and Hapur silt loam in wet areas (5 percent)

Major Uses

Current uses: Cropland, pasture
Potential use: Hayland

Cropland
Currently grown nonirrigated crops: Wheat, barley, oats
General management considerations:
• Providing drainage is difficult because most areas have poor outlets and are subject to seasonal flooding.
• A suitable cropping system, crop residue management, and applications of fertilizer help to maintain fertility and tilth.
• Supplemental irrigation may be needed during the growing season to ensure adequate moisture for crop production.
• The best suited method of irrigation is a sprinkler system.

Hayland and pasture
Dominant vegetation in potential natural plant community:
Shrubby cinquefoil, sedges, tufted hairgrass
Currently grown nonirrigated crops: Grass-legume hay, pasture
General management considerations:
• Providing drainage is difficult because most areas have poor outlets and are subject to seasonal flooding.
• Supplemental irrigation may be needed during the growing season to ensure adequate moisture for crop production.
• The best suited method of irrigation is a sprinkler system.
• Plants that can tolerate wetness are suitable for seeding.
• Grazing should be deferred until the water table lowers and the upper part of the soil is firm.

Capability Classification

IIIs, irrigated and nonirrigated

91-Pits, gavel

Position on landscape: Areas along the Big Wood and Little Wood Rivers
Kind of material: Excavated cobbles, gravel, and sand
Vegetation: Little, if any
Current use: Wildlife habitat for small rodents, marmots, rabbits, and hawks and other small birds
Capability classification: VIIIs

92-Povey-Dollarhide complex, 30 to 60 percent slopes

Composition

Povey gravelly loam, 30 to 60 percent slopes-55 percent
Dollarhide very gravelly silt loam, 30 to 60 percent slopes-25 percent
Contrasting inclusions-20 percent

Characteristics of the Povey Soil

Position on landscape: North- and east-facing mountainsides at elevations below 7,500 feet; all aspects of mountainsides at elevations above 7,500 feet
Parent material: Colluvium derived dominantly from quartzitic sandstone, conglomerate, and related rock
Elevation: 5,200 to 8,600 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 14 inches-dark grayish brown and grayish brown gravelly loam
14 to 35 inches-brown very gravelly loam

35 to 60 inches-brown extremely cobbly loam
60 inches-quartzitic sandstone

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Dollarhide Soil

Position on landscape: North- and east-lacing slopes of ridges
Parent material: Volcanic-ash-influenced colluvium derived dominantly from quartzitic sandstone and conglomerate
Elevation: 5,200 to 8,600 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 7 inches-dark grayish brown very gravelly silt loam
7 to 11 inches-light yellowish brown very gravelly silt loam
11 to 16 inches-yellowish brown extremely cobbly loam
16 inches-hard, quartzitic sandstone
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Rock outcrop on ridges (10 percent); Vitale very gravelly loam on south- and west-facing side slopes (5 percent); Blackspar very cobbly loam on southand west-facing slopes of ridges (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Povey soil-mountain big sagebrush, Idaho fescue; Dollarhide soil-mountain big sagebrush, Idaho fescue
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

93-Povey-Rock outcrop complex, 30 to 60 percent slopes

Composition

Povey gravelly loam, 30 to 60 percent slopes-55 percent
Rock outcrop-25 percent
Contrasting inclusions-20 percent

Characteristics of the Povey Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Colluvium derived dominantly from conglomerate, quartzitic sandstone, and related rock
Elevation: 5,200 to 8,600 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 14 inches-dark grayish brown and grayish brown gravelly loam
14 to 35 inches-brown very gravelly loam
35 to 60 inches-brown extremely cobbly loam
60 inches-quartzitic sandstone
Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Rock Outcrop

Position on landscape: Ridges
Kind of material: Exposed bedrock

Contrasting Inclusions

Vitale very gravelly loam on south- and west-facing slopes (10 percent); Dollarhide very gravelly fine sandy loam on ridges (5 percent); Drage gravelly loam on fan terraces (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community:

Mountain big sagebrush, Idaho fescue

General management considerations:

- Brush management and proper distribution of livestock are needed.
- Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
- Fences and stock water pipelines are limited by the slope and the areas of Rock outcrop.
- Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

94-Povey association, cold, 15 to 60 percent slopes

Composition

Povey very gravelly silt loam, cold, 15 to 60 percent slopes-45 percent

Povey gravelly loam, cold, 15 to 60 percent slopes-40 percent

Contrasting inclusions-15 percent

Characteristics of the Povey Very Gravelly Silt Loam

Position on landscape: North- and east-facing mountaintops

Parent material. Colluvium derived dominantly from quartzitic sandstone and related rock

Elevation: 7,000 to 9,250 feet

Average annual precipitation: About 20 inches

Average annual air temperature: About 37 degrees F

Frost-free period: Less than 60 days

Typical profile:

0 to 12 inches-dark grayish brown very gravelly silt loam

12 to 28 inches-dark grayish brown very gravelly loam

28 to 44 inches-brown extremely gravelly fine sandy loam

44 to 52 inches-pale brown extremely cobbly sandy loam

52 inches-quartzitic sandstone

Depth class: Deep

Drainage class: Well drained

Permeability: Moderate

Available water capacity: Low

Potential rooting depth: 40 to 60 inches

Runoff: Rapid or very rapid

Hazard of water erosion: Severe or very severe

Characteristics of the Povey Gravelly Loam

Position on landscape: South- and west-facing mountaintops

Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock

Elevation: 7,000 to 9,250 feet

Average annual precipitation: About 20 inches

Average annual air temperature: About 37 degrees F

Frost-free period: Less than 60 days

Typical profile:

0 to 14 inches-dark grayish brown and grayish brown gravelly loam

14 to 35 inches-brown very gravelly loam

35 to 60 inches-brown extremely cobbly loam

60 inches-quartzitic sandstone

Depth class: Deep

Drainage class: Well drained

Permeability: Moderate

Available water capacity: Low

Potential rooting depth: 40 to 60 inches

Runoff: Rapid or very rapid

Hazard of water erosion: Severe or very severe

Contrasting Inclusions

Dollarhide very gravelly loam on ridges (10 percent); Rock outcrop on ridges (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community:

Povey very gravelly silt loam-mountain big sagebrush, mountain snowberry, Idaho fescue; Povey gravelly loam-mountain big sagebrush, Idaho fescue

General management considerations:

- Brush management and proper distribution of livestock are needed.
- Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
- Fences and stock water pipelines are limited by the slope.
- Range seeding is not suitable in the steeper areas of this unit. In the less sloping areas, seeding is limited by the hazard of erosion and by restricted accessibility.

Capability Classification

VIIe, nonirrigated

95-Povey-Vitale association, 30 to 60 percent slopes

Composition

Povey gravelly loam, 30 to 60 percent slopes-50 percent
Vitale very gravelly loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Povey Soil

Position on landscape: North- and east-facing mountainsides at elevations below 7,500 feet; all aspects of mountainsides at elevations above 7,500 feet
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,200 to 8,600 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 14 inches-dark grayish brown and grayish brown gravelly loam
14 to 35 inches-brown very gravelly loam
35 to 60 inches-brown extremely cobbly loam
60 inches-quartzitic sandstone
Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Vitale Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Residuum and colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,200 to 8,600 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 6 inches-dark grayish brown very gravelly loam
6 to 15 inches-brown very gravelly clay loam
15 to 23 inches-light brownish gray very gravelly loam
23 inches-quartzitic sandstone
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Restriction affecting rooting depth: Bedrock at a depth of 23 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Rock outcrop on ridges (10 percent); Dollarhide very gravelly fine sandy loam on ridges and north- and east-facing convex slopes (5 percent); Rubbleland (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Povey soil-mountain big sagebrush, Idaho fescue; Vitale soil-mountain big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
• Fences and stock water pipelines are limited by the slope and by the depth to bedrock in the Vitale soil.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

96-Rehfield-Gooding complex, 2 to 15 percent slopes

Composition

Rehfield sandy loam, 2 to 15 percent slopes-50 percent
Gooding silt loam, 2 to 15 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Rehfield Soil

Position on landscape: Concave areas on basalt plains

Parent material: Eolian-influenced alluvium
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 11 inches-dark grayish brown and dark brown sandy loam
11 to 42 inches-yellowish brown and light yellowish brown sandy clay loam
42 to 67 inches-very pale brown loamy sand
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Potential rooting depth: 60 inches or more
Runoff: Slow to rapid
Hazard of water erosion: Slight to severe

Characteristics of the Gooding Soil

Position on landscape: Convex areas on basalt plains
Parent material: Alluvium over basalt or rhyolite
Elevation: 4,600 to 4,800 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 100 days
Typical profile:
0 to 9 inches-brown and pale brown silt loam
9 to 49 inches-yellowish brown, pale brown, and very pale brown silty clay and silty clay loam
49 to 62 inches-very pale brown, weakly cemented duripan
62 inches-basalt that has a silica cap
Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: High
Potential rooting depth: 40 to 60 inches
Restriction affecting rooting depth: Duripan at a depth of 49 inches
Runoff: Slow to rapid
Hazard of water erosion: Slight to severe

Contrasting Inclusions

Yutrue silty clay on playas (10 percent); Adios stony loam on toe slopes (5 percent); Rock outcrop (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Rehfield soil-basin big sagebrush, bluebunch wheatgrass; Gooding soil-Wyoming big sagebrush, bluebunch wheatgrass
Main limitation: Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVe, nonirrigated

97-Riverwash
Position on landscape: Areas along braided channels of major rivers and streams
Kind of material: Unstabilized sandy, gravelly, or cobbly sediment that is frequently flooded, washed, and reworked by rivers and streams
Vegetation: Little, if any
Contrasting inclusions: Fluvents that support plants
Capability classification: VIIIs, nonirrigated

98-Rock outcrop-Adios complex, 25 to 60 percent slopes

Composition

Rock outcrop-45 percent
Adios stony loam, 25 to 60 percent slopes-35 percent
Contrasting inclusions-20 percent

Characteristics of the Rock Outcrop

Position on landscape: Convex ridges and side slopes
Kind of material: Exposed basalt

Characteristics of the Adios Soil

Position on landscape: Convex side slopes of buttes
Parent material: Residuum, slope alluvium
Elevation: 4,600 to 4,900 feet
Average annual precipitation: About 12 inches
Average annual air temperature: About 47 degrees F
Frost-free period: About 110 days
Typical profile:
0 to 5 inches-brown and yellowish brown stony loam
5 to 23 inches-yellowish brown, light yellowish brown, and very pale brown clay and clay loam
23 to 27 inches-white, indurated duripan

27 inches-fractured rhyolite that has silica and lime in the fractures
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Low
Potential rooting depth: 22 to 31 inches
Restriction affecting rooting depth: Duripan at a depth of 23 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Furshur very channery loam in convex areas (10 percent); Rubbleland (10 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community:
Wyoming big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope, the areas of Rock outcrop, the included areas of Rubbleland, and the hazard of erosion.
• Range seeding is not suitable on this unit. It is limited by the slope, the areas of Rock outcrop, the hazard of erosion, and the stony upper layer in the Adios soil.
• Fences and stock water pipelines are limited by the slope and by depth to the duripan and to bedrock.

Capability Classification

VIIe, nonirrigated

99-Rockybar extremely cobbly loam, 2 to 30 percent slopes

Composition

Rockybar extremely cobbly loam, 2 to 30 percent slopes-75 percent
Contrasting inclusions-25 percent

Characteristics of the Rockybar Soil

Position on landscape: Outwash terraces
Parent material: Glacial outwash derived from igneous and metamorphic rock
Elevation: 5,500 to 6,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 9 inches-yellowish brown extremely cobbly loam
9 to 20 inches-light yellowish brown extremely cobbly loam
20 to 31 inches-light yellowish brown extremely cobbly clay loam
31 to 47 inches-light yellowish brown extremely cobbly loam
47 to 62 inches-yellowish brown extremely cobbly loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 60 inches or more
Runoff: Slow to rapid
Hazard of water erosion: Slight to severe

Contrasting Inclusions

Soils that are similar to the Rockybar soil but are more than 35 percent clay between depths of 9 and 31 inches and are in depressions (15 percent); soils that are similar to the Rockybar soil but are poorly drained and are along streams and other drainageways (10 percent)

Major Uses

Rangeland
Dominant vegetation in potential natural plant community:
Mountain big sagebrush, bluebunch wheatgrass
Main limitations: Extremely cobbly upper layer, hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the extremely cobbly upper layer.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Pasture

General management considerations:
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer help to improve the quality of forage on pastures.

• The best suited method of irrigation is a sprinkler system.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.
• Seeding and mechanical treatment of brush are limited by the extremely cobbly upper layer.

Capability Classification

VIs, irrigated and nonirrigated

100-Rubbleland

Position on landscape: Commonly at the base of steep slopes or escarpments along major drainageways
Kind of material: Areas covered by cobbles, stones, and boulders
Vegetation: Little, if any
Major use: Wildlife habitat for small rodents and marmots and for sage grouse, hawks, falcons, and other birds
Capability classification: VIIIs

101-Rubbleland-Milligan complex, 60 to 75 percent slopes

Composition

Rubbleland-40 percent
Milligan very cobbly loam, 60 to 75 percent slopes-35 percent
Contrasting inclusions-25 percent

Characteristics of the Rubbleland

Position on landscape: South- and west-facing side slopes
Kind of material: Areas covered by stones, flagstones, and cobbles
Vegetation: Sparse woody shrubs and annual weeds

Characteristics of the Milligan Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,200 to 8,500 feet
Average annual precipitation: About 16 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 8 inches-brown very cobbly loam
8 to 18 inches-yellowish brown extremely cobbly loam
18 to 24 inches-gray, fractured, quartzitic sandstone that has brown loam between the fracture planes and in the cracks
24 inches-quartzitic sandstone
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid in the upper 18 inches; very rapid below this depth
Available water capacity: Very low
Potential rooting depth: 20 to 40 inches
Restriction affecting rooting depth: Bedrock at a depth of 24 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Rock outcrop on ridges (15 percent); Povey gravelly loam on north- and east-facing slopes at elevations below 7,500 feet and all aspects at elevations above 7,500 feet (10 percent)

Major Use

Rangeland
(Milligan soil)
Dominant vegetation in potential natural plant community:
Mountain big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
• Fences and stock water pipelines are limited by the slope and the depth to bedrock.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIIe, nonirrigated

102-Simonton loam, 2 to 4 percent slopes

Composition

Simonton loam, 2 to 4 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Simonton Soil

Position on landscape: Fan terraces
Parent material: Alluvium derived from granite
Elevation: 4,800 to 5,500 feet

Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 12 inches-brown and yellowish brown loam
12 to 52 inches-yellowish brown and light yellowish brown clay loam and sandy clay loam
52 to 64 inches-pale brown sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Slow
Hazard of water erosion: Slight

Contrasting Inclusions

Peevywell stony loam in convex areas (10 percent); Marshdale loam in drainageways and depressions (5 percent)

Major Uses

Cropland, hayland, and pasture
Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion. Corrugation systems are also suitable.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated; IIIc, nonirrigated

103-Simonton loam, 4 to 8 percent slopes

Composition

Simonton loam, 4 to 8 percent slopes-85 percent
Contrasting inclusions-15 percent

Characteristics of the Simonton Soil

Position on landscape: Fan terraces
Parent material: Alluvium derived from granite
Elevation: 4,800 to 5,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 12 inches-brown and yellowish brown loam
12 to 52 inches-yellowish brown and light yellowish brown clay loam and sandy clay loam
52 to 64 inches-pale brown sandy loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Medium
Hazard of water erosion: Moderate

Contrasting Inclusions

Peevywell stony loam in convex areas (5 percent); Marshdale loam in drainageways and depressions (5 percent); soils that are similar to the Simonton soil but have more than 35 percent clay below the upper layer (5 percent)

Major Uses

Cropland, hayland, and pasture

Currently grown irrigated crops: Wheat, barley, oats, alfalfa hay, pasture
General management considerations:
• A suitable cropping system, crop residue management, irrigation water management, and applications of fertilizer help to maintain fertility and tilth.
• Proper grazing practices, irrigation water management, seeding of suitable forage plants, and applications of fertilizer improve the quality of forage on pastures.
• The best suited method of irrigation is a sprinkler system. Use of this method permits an even, controlled application of water, reduces the rate of runoff, and minimizes the risk of water erosion.
• Adjusting the rate at which irrigation water is applied to the available water capacity, the water intake rate, and the needs of the crop helps to prevent overirrigating and the leaching of plant nutrients.

Capability Classification

IIIe, irrigated and nonirrigated

104-Simonton-Bauscher complex, 4 to 15 percent slopes

Composition

Simonton silt loam, 4 to 15 percent slopes-50 percent
Bauscher loam, 4 to 15 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Simonton Soil

Position on landscape: Convex areas on fan terraces
Parent material: Alluvium derived from granite
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 11 inches-brown silt loam
11 to 43 inches-light yellowish brown clay loam
43 to 61 inches-light brown sandy clay loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Bauscher Soil

Position on landscape: Concave areas, depressions, and toe slopes on fan terraces
Parent material. Colluvium and alluvium derived from granite
Elevation: 4,800 to 6,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 14 inches-dark grayish brown and dark brown loam
14 to 37 inches-brown and dark yellowish brown sandy clay loam
37 to 42 inches-light yellowish brown coarse sandy loam
42 inches-weathered granitic rock
Depth class: Deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Moderate
Potential rooting depth: 40 to 60 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Contrasting Inclusions

Peevywell loam on eroded fan terraces (10 percent);
Marshdale loam in wet areas (10 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Mountain big sagebrush, Idaho fescue
Main limitation: Hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IIIe, nonirrigated

105-Starhope-Furshur complex, 4 to 15 percent slopes

Composition

Starhope loam, 4 to 15 percent slopes-50 percent
Furshur very channery loam, 4 to 15 percent slopes 30 percent
Contrasting inclusions-20 percent

Characteristics of the Starhope Soil

Position on landscape: Concave areas on ridgetops
Parent material: Residuum derived from rhyolite
Elevation: 5,000 to 5,600 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About *85* days
Typical profile:
0 to 9 inches-grayish brown and brown loam
9 to 23 inches-brown clay loam
23 to 26 inches-light brown gravelly clay loam
26 inches-rhyolite
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe

Characteristics of the Furshur Soil

Position on landscape: Convex areas on ridgetops
Parent material: Residuum derived from rhyolite
Elevation: 5,000 to 5,600 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 42 degrees F
Frost-free period: About 85 days
Typical profile:
0 to 2 inches-dark grayish brown very channery loam
2 to 5 inches-brown clay loam
5 to 15 inches-yellowish brown and brownish yellow clay and gravelly clay
15 to 20 inches-very pale brown duripan
20 inches-fractured, layered rhyolite that has lime and silica in the fractures
Depth class: Shallow
Drainage class: Well drained
Permeability: Very slow
Available water capacity: Very low
Potential rooting depth: 14 to 20 inches
Restriction affecting rooting depth: Duripan at a depth of 15 inches
Runoff: Slow or medium
Hazard of water erosion: Slight or moderate

Contrasting Inclusions

Smelter loam in convex areas (10 percent); Furshur very channery loam on toe slopes (5 percent); Rock outcrop (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Starhope soil-mountain big sagebrush, bluebunch wheatgrass; Furshur soil-alkali sagebrush, Idaho fescue
Main limitations: Very channery loam upper layer and very low available water capacity of the Furshur soil, hazard of erosion
General management considerations:
• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment. Mechanical treatment is limited by the very channery loam upper layer in the Furshur soil and by the hazard of erosion. Prescribed burning is limited on the Furshur soil by the inability of alkali sagebrush to carry fire.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

VI, nonirrigated

106-Starhope-Peevywell-Smelter loams, 4 to 30 percent slopes

Composition

Starhope loam, 4 to 30 percent slopes-35 percent
Peevywell loam, 4 to 15 percent slopes-25 percent
Smelter loam, 4 to 30 percent slopes-20 percent
Contrasting inclusions-20 percent

Characteristics of the Starhope Soil

Position on landscape: Depressions and swales on south- and west-facing slopes of foothills
Parent material: Residuum derived from andesite, latite, and welded tuff
Elevation: 5,000 to 6,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 40 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 4 inches-grayish brown loam
4 to 10 inches-brown and yellowish brown loam
10 to 30 inches-yellowish brown and light yellowish brown clay loam
30 inches-welded tuff
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate to very severe
Shrink-swell potential: High

Characteristics of the Peevywell Soil

Position on landscape: Eroded and convex areas on foothills
Parent material: Alluvium derived from mixed igneous and metamorphic rock
Elevation: 5,000 to 6,500 feet
Average annual precipitation: About 13 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 12 inches-brown loam
12 to 22 inches-yellowish brown and brown clay loam
22 to 30 inches-brown clay
30 to *44* inches-indurated duripan

44 to 61 inches-yellowish brown very gravelly sandy loam

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: Low
Potential rooting depth: 24 to 35 inches
Restriction affecting rooting depth: Duripan at a depth of 30 inches
Runoff: Medium or rapid
Hazard of water erosion: Moderate or severe
Shrink-swell potential: High

Characteristics of the Smelter Soil

Position on landscape: North- and east-facing slopes of foothills
Parent material: Residuum and alluvium derived from andesite, latite, and welded tuff
Elevation: 5,000 to 6,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 40 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 18 inches-dark grayish brown loam
18 to 35 inches-brown and yellowish brown clay loam
35 to 61 inches-light yellowish brown sandy clay loam
Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Potential rooting depth: 60 inches or more
Runoff. Medium to very rapid
Hazard of water erosion: Moderate to very severe
Shrink-swell potential: Moderate

Contrasting Inclusions

Elksel very cobbly loam on south- and west-facing slopes (10 percent); Friedman cobbly loam on steep north- and east-facing slopes (5 percent); Marshdale loam in drainageways (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Starhope soil-mountain big sagebrush, bluebunch wheatgrass; Peevywell soil-alkali sagebrush, Idaho fescue; Smelter soil-mountain big sagebrush, Idaho fescue
Main limitation: Hazard of erosion
General management considerations:

• Brush management, proper distribution of livestock, and range seeding are needed.
• Suitable methods of brush management are prescribed burning, chemical spraying, and mechanical treatment.
• Range seeding is suitable on this unit. Drilling is the best suited method.

Capability Classification

IVe, nonirrigated

107-Vitale-Blackspar complex, 30 to 60 percent slopes

Composition

Vitale very gravelly loam, *30* to 60 percent slopes-45 percent
Blackspar very cobbly loam, 30 to 60 percent slopes 35 percent
Contrasting inclusions-20 percent

Characteristics of the Vitale Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Residuum and colluvium derived dominantly from quartzitic sandstone and conglomerate
Elevation: 5,000 to 8,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 6 inches-dark grayish brown very gravelly loam
6 to 15 inches-brown very gravelly clay loam
15 to *23* inches-light brownish gray very gravelly loam
23 inches-quartzitic sandstone
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Restriction affecting rooting depth: Bedrock at a depth of *23* inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Blackspar Soil

Position on landscape: South- and west-facing slopes of ridges

Parent material: Colluvium and slope alluvium derived dominantly from quartzitic sandstone and conglomerate
Elevation: 5,200 to 8,000 feet
Average annual precipitation.: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 3 inches-brown very cobbly loam
3 to 7 inches-yellowish brown very cobbly loam
7 to 17 inches-light yellowish brown extremely cobbly loam
17 inches-quartzitic sandstone
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Restriction affecting rooting depth: Bedrock at a depth of 17 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Rock outcrop on ridges (10 percent); Povey gravelly loam on north- and east-facing slopes at elevations below 7,500 feet and on all aspects at elevations above 7,500 feet (5 percent); Drage gravelly loam on toe slopes and in drainageways (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Vitale soil-mountain big sagebrush, bluebunch wheatgrass; Blackspar soil-low sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment is limited by the slope. Prescribed burning is limited by the slope and by the difficulty of maintaining a fire on the Blackspar soil.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

108-Vitale-Milligan complex, 30 to 60 percent slopes

Composition

Vitale very gravelly loam, 30 to 60 percent slopes-50 percent
Milligan very cobbly loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Vitale Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Residuum and colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,200 to 8,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 6 inches-brown very gravelly loam
6 to 15 inches-brown very gravelly clay loam
15 to 23 inches-light brownish gray very gravelly loam
23 inches-quartzitic sandstone
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Restriction affecting rooting depth: Bedrock at a depth of 23 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Milligan Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,200 to 8,000 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 8 inches-brown very cobbly loam

8 to 18 inches-yellowish brown extremely cobbly loam
18 to 24 inches-gray, fractured, quartzitic sandstone that has brown loam in the fractures
24 inches-quartzitic sandstone

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid in the upper 18 inches; very rapid below this depth
Available water capacity: Very low
Potential rooting depth: 20 to 40 inches
Restriction affecting rooting depth: Bedrock at a depth of 24 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Rock outcrop on ridges (10 percent); Povey gravelly loam on north- and east-facing slopes at elevations above 7,500 feet (5 percent); Rubbleland (5 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Mountain big sagebrush, bluebunch wheatgrass
General management considerations:

• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
• Fences and stock water pipelines are limited by the slope and the depth to bedrock.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

109-Vitale-Povey association, 30 to 60 percent slopes

Composition

Vitale very gravelly loam, 30 to 60 percent slopes-50 percent
Povey gravelly loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Vitale Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Residuum and colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,200 to 8,600 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 6 inches-dark grayish brown very gravelly loam
6 to 15 inches-brown very gravelly clay loam
15 to 23 inches-light brownish gray very gravelly loam
23 inches-quartzitic sandstone

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Restriction affecting rooting depth: Bedrock at a depth of 23 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Povey Soil

Position on landscape. North- and east-facing mountainsides at elevations below 7,500 feet; all aspects of mountainsides at elevations above 7,500 feet
Parent material: Colluvium derived dominantly from quartzitic sandstone and related rock
Elevation: 5,200 to 8,600 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 14 inches-dark grayish brown and grayish brown gravelly loam
14 to 35 inches-brown *very* gravelly loam
35 to 60 inches-brown extremely cobbly loam
60 inches-quartzitic sandstone

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Potential rooting depth: 40 to 60 inches

Runoff:: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Rock outcrop on ridges (10 percent); Dollarhide very gravelly fine sandy loam on ridges and north- and east-facing slopes (5 percent); Rubbleland (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Vitale soil-mountain big sagebrush, bluebunch wheatgrass; Povey soil-mountain big sagebrush, Idaho fescue
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Mechanical treatment and prescribed burning are limited by the slope.
• Fences and stock water pipelines are limited by the slope and by the depth to bedrock in the Vitale soil.
• Range seeding is not suitable on this unit because of the slope and the hazard of erosion.

Capability Classification

VIIe, nonirrigated

110-Winu-Rock outcrop complex, 30 to 60 percent slopes

Composition

Winu stony loam, 30 to 60 percent slopes-70 percent
Rock outcrop-20 percent
Contrasting inclusions-10 percent

Characteristics of the Winu Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Colluvium derived dominantly from latite, andesite, and basalt
Elevation: 5,500 to 7,500 feet
Average annual precipitation: About 18 inches
Average annual air temperature: About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 13 inches-dark grayish brown and brown stony loam
13 to 21 inches-brown gravelly loam
21 to 35 inches-yellowish brown gravelly clay loam
35 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 24 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Rock Outcrop

Position on landscape: Convex areas, ridgetops
Kind of material: Exposed basalt

Contrasting Inclusions

Elkcreek loam on south- and west-facing slopes (5 percent); Gaib stony loam on south- and westfacing slopes (5 percent)

Major Use

Rangeland
Dominant vegetation in potential natural plant community: Mountain big sagebrush, Idaho fescue
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope, the hazard of erosion, and the areas of Rock outcrop.
• Range seeding is not suitable on this unit because of the slope, the hazard of erosion, and the stony upper layer in the Winu soil.
• Fences and stock water pipelines are limited by the slope, the hazard of erosion, and the areas of Rock outcrop.

Capability Classification

VIIe, nonirrigated

111-Winu-Gaib association, 30 to 60 percent slopes

Composition

Winu stony loam, 30 to 60 percent slopes-50 percent
Gaib very gravelly loam, 30 to 60 percent slopes-30 percent
Contrasting inclusions-20 percent

Characteristics of the Winu Soil

Position on landscape: North- and east-facing mountainsides
Parent material: Colluvium derived dominantly from latite, andesite, and basalt

Elevation: 5,500 to 7,500 feet
Average annual precipitation: About 18 inches
Average annual air temperature. About 39 degrees F
Frost-free period: Less than 60 days
Typical profile:
0 to 13 inches-dark grayish brown and brown stony loam
13 to 21 inches-brown gravelly loam
21 to 35 inches-yellowish brown gravelly clay loam
35 inches-basalt
Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Potential rooting depth: 20 to 40 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Characteristics of the Gaib Soil

Position on landscape: South- and west-facing mountainsides
Parent material: Residuum derived from andesite, latite, and basalt
Elevation: 5,500 to 7,500 feet
Average annual precipitation: About 14 inches
Average annual air temperature: About 41 degrees F
Frost-free period: About 75 days
Typical profile:
0 to 5 inches-brown very gravelly loam
5 to 13 inches-dark yellowish brown very cobbly clay loam
13 inches-basalt
Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Very low
Potential rooting depth: 10 to 20 inches
Runoff: Very rapid
Hazard of water erosion: Very severe

Contrasting Inclusions

Elkcreek loam on concave south- and west-facing slopes (10 percent); Rock outcrop in convex areas (10 percent)

Major Use

Rangeland

Dominant vegetation in potential natural plant community: Winu soil-mountain big sagebrush, Idaho fescue; Gaib soil-mountain big sagebrush, bluebunch wheatgrass
General management considerations:
• Brush management and proper distribution of livestock are needed.
• Chemical spraying is a suitable method of brush management. Prescribed burning and mechanical treatment are limited by the slope and the hazard of erosion.
• Range seeding is not suitable on this unit because of the slope, the hazard of erosion, and the stony upper layer in the Winu soil.
• Fences and stock water pipelines are limited by the slope, the hazard of erosion, and the depth to bedrock.

Capability Classification

VIIe, nonirrigated

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's shortand long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Soils that have limitations, such as a seasonal high water table, frequent flooding during the growing season, or inadequate rainfall, qualify for prime farmland only in areas where these limitations have been overcome by such measures as drainage, flood control, or irrigation. The need for these measures is indicated after the map unit name on the following list. Onsite evaluation is necessary to determine whether or not these limitations have been overcome by corrective measures.

The following map units meet the soil requirements for prime farmland. Some of the units meet the requirements only if an adequate and dependable supply of irrigation water is available. The location of each map unit is shown on the detailed soil maps at the back of this publication. Soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

1	Adamson loam, 0 to 2 percent slopes (where irrigated)
9	Bancroft silt loam, 1 to 4 percent slopes
10	Bancroft silt loam, 4 to 8 percent slopes
15	Bringmee loam, 0 to 2 percent slopes
16	Bringmee loam, 2 to 4 percent slopes
17	Bringmee loam, 4 to 8 percent slopes
19	Bringmee-Little Wood complex, 1 to 4 percent slopes (where irrigated)
21	Carey Lake loam, 0 to 2 percent slopes
22	Carey Lake loam, 2 to 4 percent slopes
28	Drage gravelly loam, 4 to 8 percent slopes (where irrigated)
31	Drage very gravelly loam, cool, 0 to 3 percent slopes (where irrigated)
51	Isknat gravelly clay loam, 0 to 2 percent slopes (where irrigated)
52	Justesen loam, 2 to 4 percent slopes
53	Justesen loam, 4 to 8 percent slopes
64	Little Wood gravelly loam, 0 to 2 percent slopes (where irrigated)
65	Little Wood gravelly loam, 2 to 4 percent slopes (where irrigated)
66	Little Wood very gravelly loam, 0 to 2 percent slopes (where irrigated)

67 Little Wood very gravelly loam, 2 to 4 percent slopes (where irrigated)
68 Little Wood very gravelly loam, cool, 1 to 4 percent slopes (where irrigated)
74 McCarey-Justesen loams, 2 to 8 percent slopes
76 McCarey-Molyneux loams, 2 to 8 percent slopes
78 Molyneux loam, 2 to 4 percent slopes
79 Molyneux loam, 4 to 8 percent slopes
102 Simonton loam, 2 to 4 percent slopes
103 Simonton loam, 4 to 8 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Prepared by Gale Roberts, district conservationist, Soil Conservation Service.

General management needed for crops and pasture is suggested in this section. The system of land capability classification used by the Soil Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

About 79,000 acres of the survey area is used as cropland, hayland, and pasture. Of this, about 29,000 acres is used primarily for cultivated crops and 50,000 acres is used for hay and pasture. About 72,680 acres, or 92 percent, of the cropland, hayland, and pasture is irrigated.

Spring wheat and barley are the main crops grown in the area. Because temperatures are cool, high-quality malting barley can be grown. The short growing season limits the production of most row crops. Less than 500 acres is used for potatoes and silage corn. Spring grain commonly is grown as a cash crop before hay or other grain is established. Growing hay, grain, and pasture in combination with a livestock operation is the most common farming enterprise in the survey area.

If grain is grown, crop residue should be left on the surface to maintain the organic matter content and tilth of the soil and to control erosion. Including grasses and legumes in the cropping system also helps to control erosion and maintain fertility and tilth. Grain generally responds to nitrogen, and legumes respond to phosphorus. A good fertilization program is essential for maximum production.

Steeply sloping soils should be farmed across the slope. Tillage should be designed to keep the soil surface rough and cloddy. A minimum of 1,500 pounds of crop residue should be kept on the soil surface in winter and early in spring to protect the soil from erosion. Minimum tillage and no-till are suitable practices.

Irrigation water is supplied by streams and rivers, reservoirs, and wells. Sprinkler irrigation is the most

widely used method of applying water. Applications of irrigation water should be adjusted to the available water capacity of the soil, the water intake rate, and the needs of the crops.

Drainage from local seeps and from wet soils on bottom land is a concern in some areas. Open drains and tile lines can be used effectively. Some of the soils have a seasonal high water table and are subject to flooding, which limits the kinds of crops that can be grown and their yields.

Much of the pasture in the area is in poor condition because of continuous overgrazing, a lack of sufficient fertilizer, and the encroachment of less productive plants. As a result, the production of forage has been greatly reduced. Because of the limited plant cover, soil erosion and gullying occur in the drainageways in some areas.

Among the suitable management practices are rotation grazing, crossfencing, constructing water developments, and allowing adequate periods for regrowth. Use of high-producing, suitable plants and applications of fertilizer, including nitrogen, phosphorus, and sulfur, are needed to improve the condition of the pasture. Grasses generally respond to nitrogen and sulfur, and legumes respond to phosphorus. Livestock should not be allowed to graze too early in spring, before the plants have reached adequate growth and the soils are firm enough to withstand trampling.

Hayland can be improved by applying fertilizer, cutting hay only when it is at the proper protein content, and leaving an adequate amount of fall stubble.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland and for engineering purposes.

In the capability system (15), soils generally are grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants. or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use. Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e,* w, s, or c, to the class numeral, for example, IIIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by w, s, or c because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Rangeland

Prepared by Dennis K. Froeming, area range conservationist, Soil Conservation Service.

About 662,174 acres, or 82 percent, of the survey area is used as rangeland. Of this, about 597,094 acres is administered by the Bureau of Land Management and 65,080 acres is administered by the state or is privately owned. The rangeland is used for livestock and wildlife grazing, as recreation sites, and as valuable watershed for the Big Wood and Little Wood Rivers. Sheep and cattle operations contribute significantly to the economy of the survey area. The rangeland is best suited to grazing in spring and summer.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Table 6 shows, for each soil, the range site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. Only those soils that are used as rangeland or are suited to use as rangeland are listed. An explanation of the column headings in table 6 follows.

A range site is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants (17). The relationship between soils and vegetation was established during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Each range site is identified by a range site number, a name that includes soil or topographic characteristics and the mean annual precipitation, and the main species in the plant community. The range site numbers are used mainly to coordinate range sites within and between states. *011by003i is* an example of such a number. The first three digits identify the major land resource area. The next 2 letters are subdivisions of the land resource area. If there are no subdivisions, an x and y appear in these positions. The next three digits make up the coordinated range site number, which is followed by a letter that identifies the state in which the range site occurs. Land resource area subdivision maps are available at the local offices of the Soil Conservation Service. The key indicator species in the plant community are given in abbreviated form following the range site name and number. The abbreviations are defined in the "National List of Scientific Plant Names" (18).

Total production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruit of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal

year, growing conditions are about average. In an unfavorable year, growing conditions are well below average because of low available soil moisture, cool temperatures, and other factors.

Dry weight is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

Characteristic vegetation-the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil-is listed by common name. Under *composition,* the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community in a given use.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

The primary management practice needed on rangeland in this survey area is a planned grazing system that allows plants to achieve sufficient growth in spring to withstand grazing pressure, allows the soils to dry out in spring to avoid damage from trampling, allows for periodic rest or deferment of grazing, and allows for removal of livestock when an optimum amount of forage has been grazed. Practices such as constructing water developments and fences, managing brush, range seeding, and properly distributing livestock facilitate the grazing system and help to bring about needed changes in the plant community. The suitability of specific practices is determined by the various characteristics of individual soils.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, hold snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 7 shows the height that locally grown trees and shrubs are predicted to reach in 20 years on various soils. The estimates in table 7 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a nursery.

Recreation

The survey area includes many scenic areas and recreational opportunities. The Sun Valley ski resort is at the northern end of the area. Trout fishing is excellent in the rivers, creeks, and manmade reservoirs. Silver Creek, a fly fishing stream, is in the middle of the survey area.

Big game animals, including deer, elk, antelope, bear, and mountain goat, and waterfowl inhabit the area and provide good hunting opportunities. Many of these species can be found in the lower lying foothills and valleys much of the year.

Many public and private recreational facilities are available in the area. Most of these facilities provide services year round. The demand for recreational facilities is expected to increase during the next several years.

The soils of the survey area are rated in table 8

according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties generally are favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 9 and interpretations for septic tank absorption fields in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils are gently sloping and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Prepared by Mike Anderson, biologist, Soil Conservation Service.

The survey area provides favorable habitat for many kinds of wildlife. The diverse areas of rangeland, woodland, cropland, hayland, and water provide food and cover for many mammals, birds, and fish.

The largest and most abundant game fish in the survey area is rainbow trout. Brook trout inhabit the headwaters of many of the streams. Other important species include brown trout, cutthroat trout, and smallmouth bass. Important fishing waters include Magic Reservoir, the Big Wood River, the Little Wood River, and Silver Creek. Silver Creek has received national and international acclaim for its superb rainbow trout fly fishing opportunities.

Wildlife populations are determined largely by the supply of food, cover, and water. Habitats differ in their capacity to provide these essential needs. Some of these differences result from the various characteristics of the soils, and others result from the various kinds of management used. Good management is needed to improve and maintain habitat for wildlife.

Wildlife in the survey area use the riparian areas more than any other type of habitat. Big game and upland game animals use riparian areas for water, food, and cover. Many species of nongame birds and mammals use this habitat during part or all of their life cycle. Many other species, including beaver, muskrat, waterfowl, and several amphibians, live in riparian areas almost exclusively. Plant production and diversity are

highest in riparian areas, thus increasing the value of these areas to wildlife. Riparian areas are also attractive to livestock, especially cattle, because they provide shade, water, and food. The soils in general soil map units 11 and 14 are best suited to the development of riparian habitat.

Mule deer are the most abundant of the big game animals, but elk and pronghorn antelope are also in the area. The major winter range for deer is in the southern half of the survey area (21). The survey area provides crucial winter range for elk and summer range for antelope. Coyote, fox, badger, skunk, and numerous rodents, including ground and tree squirrels, are found throughout the area.

Waterfowl use habitat throughout the area, but the largest populations are along Silver Creek, in the Gannett and Picabo areas, and around Carey Lake. Principal waterfowl species include Canada geese, mallards, teal, sandhill cranes, and great blue heron.

Sage grouse is the dominant upland game bird in the area. It is found mainly in areas that support sagebrush and bunchgrass, but it also feeds in wetland and wet meadow areas late in spring and in summer. Chukars are scattered throughout the southern half of the area on rocky soils that are in canyons, have talus slopes, and are near a dependable water supply. Blue grouse are scattered throughout the northern half of the survey area in riparian areas that are close to stands of timber. These birds raise their broods in the riparian areas and feed on the insects and forbs. In winter, they commonly roost in fir trees at the slightly higher elevations.

Limited numbers of pheasants, Hungarian partridge, and quail are found in the southern half of the area. The pheasants are in the Carey area; quail are east of Magic Reservoir, along the Big Wood and Little Wood Rivers; and Hungarian partridge are throughout the southern half of the survey area. Mourning doves are found throughout the area in summer. They migrate out of the area in fall and then return in spring.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building Site Development, Sanitary Facilities, Construction Materials, and Water Management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a

special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills generally are limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 10 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which

effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage because of rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill-trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as *a probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel, or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. These soils may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils generally is preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features generally are favorable for

the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, and terraces and diversions.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (2) and the system adopted by the American Association of State Highway and Transportation Officials (1).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification; for example, SM-SC.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-

weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The

change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low,* a change of less than 3 percent; *moderate, 3* to 6 percent; and *high,* more than 6 percent. *Very high,* more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 14, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 15 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from longduration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These

consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding, nor is standing water in swamps and marshes or in closed depressional areas.

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table-that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 15.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the column "High water table" indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table is above a depth of 6 feet for less than a month.

Table 16 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Cemented pans are cemented or indurated subsurface layers within a depth of 5 feet. Such pans cause difficulty in excavation. Pans are classified as thin or thick. A thin pan is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A thick pan is more than 3 inches thick if continuously indurated or more than 18 inches thick if discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 16 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which usually is a result of oxidation.

Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the

freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (16). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol.* An example is Inceptisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ochrept *(Ochr,* meaning pale, *plus ept,* from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Cryochrepts *(Cry,* meaning cold, *plus ochrept,* the suborder of the Inceptisols that has a pale epipedon).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Cryochrepts.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particlesize class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed Typic Cryochrepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

The classification of some of the soils in adjoining counties is different from that of adjacent soils in this survey area. These differences are the result of a gradual change in many soil characteristics over a distance of many miles. The exact point that the characteristics change enough to warrant a change in classification is difficult to define or locate. In some cases, therefore, manmade lines, such as county lines, were used.

The soils in Camas County that border the survey area on the west differ in one or more characteristics as a result of differences in names and classification. The Roanhide soils established in the western part of Camas County have slightly lower annual precipitation than the similar Moonstone soils in this survey area. This slightly higher annual precipitation has resulted in an abundance of grasses in the plant community on the Moonstone soils. These grasses annually add more organic matter to the soil surface. As a result the Moonstone soils have a slightly thicker dark surface horizon than the Roanhide soils.

Another example of soils that do not match along the

Blaine-Camas county line is that of the Peevywell soils in the survey area and the Rands soils in Camas County. The Peevywell soils have a duripan 20 to 40 inches thick, and the Rands soils do not have a duripan. Because Camas County was mapped first, the extent of the Peevywell soils that were observed and documented was too small for the soils to be mapped separately and established as a soil series. The Peevywell soils, therefore, were combined with the Rands soils because use and management needs are similar for both soils. In this survey area, however, the acreage of Peevywell soils is sufficient to establish a separate series.

The Bringmee soils in this survey area are well drained, and the Brinegar soils in Camas County are moderately well drained. There are no Brinegar soils in Blaine County, so the two different but similar soils join at the county line.

The soils that join Blaine County on the south, east, and north either match or have not yet been mapped and classified.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (14).* Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (16).* Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each series are described in the section "Detailed Soil Map Units."

Adamson Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate to a depth of 28 inches; very rapid below this depth
Position on landscape: Stream terraces, flood plains
Parent material: Alluvium derived from various kinds of rock
Slope: 0 to 2 percent
Elevation: 4,700 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Coarse-loamy over sandy or sandy-skeletal, mixed, frigid Calcic Pachic Haploxerolls

Typical Pedon

A-0 to 5 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many very fine interstitial pores; neutral (pH 6.6); clear smooth boundary.

BA-5 to 19 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure; slightly hard, friable; many fine roots; common *very* fine interstitial pores; neutral (pH 6.6); clear smooth boundary.

Bw-19 to 28 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable; many fine and medium roots; about 5 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary.

2Bk-28 to 61 inches; light brownish gray (10YR 6/2) very gravelly coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose; few fine roots; about 40 percent pebbles and 20 percent cobbles; slightly effervescent (accumulations of lime on undersides of rock fragments); mildly alkaline (pH 7.8).

Typical Pedon Location

Map unit in which located: Adamson loam, 0 to 2 percent slopes
Location in survey area: About 3 miles south and 1 mile west of Bellevue; about 800 feet west and 125 feet south of the northeast corner of sec. 23, T. 1 N., R. 18 E.

Range in Characteristics

Depth to loose sand and rock fragments: 23 to 36 inches
Thickness of mollic epipedon: 20 to 36 inches
Depth to water table (flooded areas): 48 to 72 inches from April to June
Average annual soil temperature: 42 to 47 degrees F
Other characteristics: 2Bkq horizon in some pedons
A horizon.

Value-3 to 5 dry, 2 or 3 moist
Chroma-1 to 3 dry or moist
Reaction-slightly acid to mildly alkaline

BA and Bw horizons:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Texture-loam, fine sandy loam, or very fine sandy loam
Content of rock fragments-0 to 15 percent
Content of clay-8 to 18 percent
Reaction-slightly acid to mildly alkaline

2Bk horizon:
Texture-very gravelly coarse sand, very gravelly sand, extremely gravelly coarse sand, extremely cobbly loamy coarse sand, extremely cobbly coarse sand, or extremely stony coarse sand
Content of rock fragments-35 to 85 percent
Content of clay-0 to 5 percent
Reaction-neutral or mildly alkaline

Adios Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Position on landscape: Sides of buttes, basalt plains
Parent material: Residuum and slope alluvium derived from rhyolite and andesite
Slope: 8 to 60 percent
Elevation: 4,600 to 5,200 feet
Average annual precipitation: 11 to 13 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 100 to 120 days
Taxonomic class: Fine, montmorillonitic, mesic Aridic Durixerolls

Typical Pedon

A1-0 to 2 inches; brown (10YR 5/3) stony loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine tubular pores; about 5 percent pebbles and 2 percent stones; neutral (pH 7.0); clear smooth boundary.

A2-2 to 5 inches; brown (10YR 5/3) stony loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, friable, slightly sticky and plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine tubular pores; about 5 percent pebbles and 2 percent stones; neutral (pH 7.0); clear wavy boundary.

Bt1-5 to 8 inches; yellowish brown (10YR 5/4) clay loam, dark brown (10YR 3/3) moist; strong fine subangular blocky structure; slightly hard, firm, sticky and plastic; common fine and medium roots; common very fine and fine tubular pores; few thin clay films lining pores and on faces of peds; about 5 percent pebbles and 3 percent stones; neutral (pH 7.2); abrupt wavy boundary.

Bt2-8 to 16 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong fine and medium prismatic structure; very hard, very firm, very sticky and very plastic; common fine and medium roots concentrated along vertical faces of peds; common fine tubular pores; many thick clay films lining pores and on faces of peds; about 5 percent pebbles; mildly alkaline (pH 7.4); gradual wavy boundary.

Bt3-16 to 20 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate fine and medium prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common fine and medium roots concentrated along vertical faces of peds; few fine tubular pores; many moderately thick clay films lining pores and on faces of peds; about 5 percent pebbles; mildly alkaline (pH 7.6); clear wavy boundary.

Btk-20 to 23 inches; very pale brown (10YR 7/4) clay loam, light yellowish brown (10YR 6/4) moist; strong fine and medium angular blocky structure; very hard, firm, sticky and plastic; common fine roots; few fine tubular pores; few moderately thick clay films on faces of peds; about 10 percent pebbles and 3 percent stones; strongly effervescent (about 20 percent lime); mildly alkaline (pH 7.8); abrupt smooth boundary.

Bqkm-23 to 27 inches; white (10YR 8/2), indurated duripan, pale brown (10YR 6/3) moist; massive; root mats on top of silica cap; about 10 percent pebbles, 5 percent cobbles, and 3 percent stones; continuous silica cap 1 to 2 millimeters thick at a depth of 23 inches; violently effervescent (about 30 percent lime); moderately alkaline (pH 8.2); abrupt wavy boundary.

R-27 inches; fractured rhyolite; silica and lime in fractures.

Typical Pedon Location

Map unit in which located: Adios association, 8 to 25 percent slopes
Location in survey area: About 3 miles southeast of dam on Magic Reservoir; about 1,800 feet north and

2,600 feet west of the southeast corner of sec. 22, T. 2 S., R. 18 E.

Range in Characteristics

Depth to bedrock: 26 to 36 inches
Depth to duripan: 22 to 31 inches
Thickness of mollic epipedon: 7 to 11 inches
Average annual soil temperature: 47 to 52 degrees F

A horizon:
Chroma-2 to 4 dry or moist
Content of pebbles-0 to 5 percent
Content of stones-0 to 2 percent

Bt1horizon:
Value-4 or 5 dry, 3 or 4 moist
Chroma-3 or 4 dry or moist
Content of pebbles-5 to 10 percent
Content of stones-0 to 3 percent

Bt2 and Bt3 horizons:
Hue-10YR or 7.5YR
Value-4 to 6 dry, 3 to 5 moist
Chroma-3 or 4 moist
Texture-clay, clay loam, or gravelly clay
Content of pebbles-0 to 15 percent
Content of stones and cobbles-0 to 10 percent
Content of clay-35 to 60 percent
Reaction-neutral or mildly alkaline

Btk horizon:
Value-5 or 6 moist
Texture-clay loam or gravelly clay loam

Bqkm horizon:
Hue-7.5YR or 10YR
Value-6 or 7 moist
Chroma-1 or 2 dry, 2 or 3 moist
Content of lime-15 to 40 percent
Reaction-mildly alkaline or moderately alkaline
Other characteristics-indurated plates 1 to 3 inches apart

Balaam Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid in the upper 21 inches; very rapid below this depth
Position on landscape: Stream terraces, flood plains
Parent material: Alluvium derived from various kinds of rock
Slope: 0 to 4 percent
Elevation: 4,700 to 6,100 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Sandy-skeletal, mixed, frigid Entic Ultic Haploxerolls

Typical Pedon

A1-0 to 3 inches; grayish brown (10YR 5/2) gravelly sandy loam, *very* dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, firm; many very fine and fine roots; many fine interstitial pores; about 20 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

A2-3 to 14 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable; many fine roots; many fine interstitial pores; about 30 percent pebbles; slightly acid (pH 6.4); gradual smooth boundary.

2Bw-14 to 21 inches; light brownish gray (10YR 6/2) very gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable; common fine roots; about 50 percent pebbles; neutral (pH 6.8); clear wavy boundary.

3Bk-21 to 61 inches; grayish brown (10YR 5/2) extremely gravelly coarse sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; few fine roots; 50 percent pebbles and 10 percent cobbles; mildly alkaline (pH 7.8); slightly effervescent (about 5 percent lime, coatings of lime and silica less than 1 millimeter thick on undersides of coarse fragments).

Typical Pedon Location

Map unit in which located: Balaam gravelly sandy loam, 0 to 2 percent slopes
Location in survey area: About 3 miles south of Bellevue; about 1,120 feet south and 2,450 feet west of the northeast corner of sec. 13, T. 1 N., R. 18 E.

Range in Characteristics

Depth to loose sand and rock fragments: 14 to 35 inches
Thickness of mollic epipedon: 10 to 18 inches
Average annual soil temperature: 42 to 47 degrees F
Base saturation: 50 to 75 percent
Depth to water table (flooded areas): More than 60 inches from April to June

A horizon:
Value-3 to 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist

Texture-gravelly sandy loam or very gravelly sandy loam
Content of rock fragments-15 to 50 percent
Reaction-strongly acid to neutral

2Bw horizon:
Value-4 to 6 dry, 3 or 4 moist
Chroma-2 to 4 moist or dry
Texture-very gravelly coarse sandy loam, very gravelly sandy loam, very gravelly fine sandy loam, or very cobbly sandy loam
Content of clay-5 to 12 percent
Content of rock fragments-35 to 55 percent
Reaction-strongly acid to mildly alkaline

3Bk horizon:
Texture-extremely gravelly coarse sand, extremely gravelly loamy coarse sand, extremely cobbly loamy coarse sand, or extremely cobbly coarse sand
Content of clay-0 to 10 percent
Content of rock fragments-60 to 85 percent
Reaction-strongly acid to mildly alkaline

Bancroft Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Basalt plains
Parent material: Silty alluvium
Slope: 1 to 8 percent
Elevation: 4,800 to 5,200 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 45 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-silty, mixed, frigid Calcic Argixerolls

Typical Pedon

A1-0 to 6 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; neutral (pH 7.0); clear smooth boundary.

A2-6 to 11 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; common very fine and fine interstitial and tubular pores; neutral (pH 7.2); gradual wavy boundary.

Bt1-11 to 21 inches; yellowish brown (10YR 5/4) silty clay loam, brown (10YR 4/3) moist; strong medium and coarse angular blocky structure; very hard, firm, sticky and plastic; common fine and medium roots; common very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; mildly alkaline (pH 7.4); gradual wavy boundary.

Bt2-21 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam, brown (10YR 4/3) moist; strong medium and coarse angular blocky structure; very hard, very firm, sticky and plastic; common fine and medium roots; common very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; mildly alkaline (pH 7.4); gradual wavy boundary.

Btk-28 to 33 inches; dark yellowish brown (10YR 4/4) silty clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium angular blocky structure; hard, firm, sticky and plastic; few *very* fine and fine roots; few very fine and fine tubular pores; common thin clay films on faces of peds and lining pores; slightly effervescent (about 5 percent lime); mildly alkaline (pH 7.8); clear wavy boundary.

Bk1-33 to 42 inches; very pale brown (10YR 8/3) silt loam, pale brown (10YR 6/3) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; moderately alkaline (pH 8.0); violently effervescent (about 25 percent lime); abrupt wavy boundary.

2Bk2-42 to 58 inches; very pale brown (10YR 7/4) gravelly loamy sand, light yellowish brown (10YR 6/4) moist; massive; hard, firm; few very fine and fine roots; about 20 percent pebbles; moderately alkaline (pH 8.0); violently effervescent (about 25 percent lime); gradual wavy boundary.

2Bk3-58 to 80 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; massive; very hard, friable; 15 to 25 percent pebbles and cobbles; moderately alkaline (pH 8.0); violently effervescent (about 20 percent lime).

Typical Pedon Location

Map unit in which located: Bancroft silt loam, 4 to 8 percent slopes
Location in survey area: About 10 miles east and 1 mile north of Carey; about 2,300 feet east and 2,400 feet north of the southwest corner of sec. 19, T. 15 N., R. 23 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Depth to calcic horizon: 19 to 40 inches
Thickness of mollic epipedon: 10 to 16 inches
Average annual soil temperature: 42 to 47 degrees F
Content of clay in particle-size control section: 18 to 32 percent
Other characteristics: Btk horizon absent in some pedons

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Reaction-slightly acid or neutral

Bt horizon:
Value-4 to 6 dry, 3 or 4 moist
Chroma-2 to 4 dry or moist
Texture-silt loam or silty clay loam
Content of clay-18 to 32 percent
Reaction-slightly acid to mildly alkaline

Bk horizon:
Value-6 to 8 dry, 4 to 6 moist
Chroma-2 to 4 dry or moist
Texture-silt loam or silty clay loam
Reaction-mildly alkaline or moderately alkaline

28k horizon:
Value-7 or 8 dry
Content of rock fragments-15 to 25 percent
Reaction-mildly alkaline or moderately alkaline

Bauscher Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Fan terraces, foothills
Parent material: Alluvium and colluvium derived from granite
Slope: 4 to 30 percent
Elevation: 4,800 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-loamy, mixed, frigid Pachic Ultic Argixerolls

Typical Pedon

A1-0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine, medium, and coarse roots; many very fine interstitial pores; slightly acid (pH 6.2); gradual wavy boundary.

A2-7 to 14 inches; dark brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; soft, friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; many fine interstitial pores; slightly acid (pH 6.2); clear wavy boundary.

Bt1-14 to 26 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; few thin clay films on faces of peds and bridging sand grains; slightly acid (pH 6.4); clear wavy boundary.

Bt2-26 to 37 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; few thin clay films on faces of peds and bridging sand grains; about 5 percent pebbles; slightly acid (pH 6.4); clear *wavy* boundary.

BC-37 to 42 inches; light yellowish brown (10YR 6/4) coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium and coarse subangular blocky structure; hard, friable; few fine and medium roots; few fine and very fine tubular pores; about 5 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.

Cr-42 to 60 inches; weathered granite.

Typical Pedon Location

Map unit in which located: Moonstone-Bauscher complex, *8* to 30 percent slopes
Location in survey area: About 7 miles south and 4 miles west of Bellevue; about 2,000 feet east and 200 feet south of the northwest corner of sec. 32, T. 1 N., R. 18 E.

Range in Characteristics

Depth to bedrock: 40 to 60 inches
Thickness of mollic epipedon: 20 to 30 inches
Base saturation (in some part above a depth of 30 inches): 50 to 75 percent
Average annual soil temperature: 42 to 46 degrees F
Average summer soil temperature: 60 to 65 degrees F

A horizon:
Value-4 or 5 dry, 2 or 3 moist

Bt horizon:
Hue-10YR or 7.5YR

Value-4 to 6 dry
Texture-sandy clay loam or loam
Content of rock fragments-0 to 10 percent
Content of clay-18 to 30 percent

BC horizon:
Value-5 or 6 dry
Chroma-3 or 4 dry
Content of rock fragments-5 to 20 percent

Bickett Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Position on landscape: Flood plains
Parent material: Material derived from herbaceous plants over silty alluvium
Slope: 0 to 2 percent
Elevation: 4,700 to 5,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-silty, mixed (calcareous), frigid Histic Humaquepts

Typical Pedon

Oek1-0 to 3 inches; dark yellowish brown (10YR 4/4) mucky peat, black (10YR 2/1) moist; about 50 percent fibers, 25 percent rubbed; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; slightly effervescent (about 5 percent lime); neutral (pH 7.2); clear smooth boundary.

Oek2-3 to 6 inches; black (N 2/0) mucky peat, black (N 2/0) moist; about 50 percent fibers, 20 percent rubbed; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; slightly effervescent (about 5 percent lime); neutral (pH 7.3); clear wavy boundary.

Oak-6 to 11 inches; gray (10YR 5/1) muck, black (10YR 2/1) moist; about 40 percent fibers, 10 percent rubbed; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; slightly effervescent (about 5 percent lime); mildly alkaline (pH 7.6); clear smooth boundary.

2Bkg1-11 to 24 inches; light gray (2.5Y 7/1) silty clay loam, light brownish gray (2.5Y 6/1) moist; massive; very hard, very firm, very sticky and very plastic; common very fine, fine, and medium roots; few very fine and fine tubular pores; strongly effervescent (about 15 percent lime); mildly alkaline (pH 7.8); gradual wavy boundary.

2Bkg2-24 to 40 inches; light gray (2.5Y 7/1) silty clay loam, light brownish gray (2.5Y 6/1) moist; massive; very hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine and fine tubular pores; 5 percent pebbles; strongly effervescent (about 15 percent lime); mildly alkaline (pH 7.4); clear wavy boundary.

3Cg-40 to 61 inches; gray (5Y 6/1) loam, dark gray (5Y 4/1) moist; massive; hard, firm, sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; 10 percent pebbles; neutral (pH 7.0).

Typical Pedon Location

Map unit in which located: Hapur-Bickett complex, 0 to 2 percent slopes
Location in survey area: About 3 miles south of Gannett; about 500 feet east and 200 feet north of the southwest corner of sec. 23, T. 1 S., R. 19 E.

Range in Characteristics

Depth to water table: 6 inches above the surface to 6 inches below
Thickness of the organic layer: 8 to 16 inches
Content of organic carbon: 12 to 18 percent
Average annual soil temperature: 42 to 47 degrees F

O horizon:
Hue-10YR or neutral
Value-2 to 5 dry
Content of lime-5 to 25 percent
Reaction-neutral or mildly alkaline

2Bkg horizon:
Hue-2.5Y or 5Y
Value-6 or 7 dry, 4 to 6 moist
Texture-silt loam or silty clay loam
Content of lime-10 to 30 percent
Reaction-mildly alkaline or moderately alkaline

3Cg horizon:
Hue-2.5Y or 5Y
Value-5 to 7 dry, 2 to 6 moist
Texture-clay loam, loam, or gravelly fine sandy loam
Content of rock fragments-5 to 30 percent
Content of lime-0 to 5 percent

Blackspar Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Mountainsides
Parent material: Colluvium and alluvium derived from quartzitic sandstone and conglomerate
Slope: 30 to 75 percent
Elevation: 5,200 to 8,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal, mixed, frigid Lithic Mollic Haploxeralfs

Typical Pedon

A-0 to 3 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; about 20 percent pebbles and 20 percent cobbles; neutral (pH 6.8); clear wavy boundary.

Bt1-3 to 7 inches; yellowish brown (10YR 5/4) very cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate *very* fine and fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; about 35 percent cobbles and 20 percent pebbles; few thin clay films on faces of peds and in pores; neutral (pH 6.8); clear wavy boundary.

Bt2-7 to 17 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate very fine and fine angular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; about 30 percent cobbles and 35 percent pebbles; common thin clay films on faces of peds and in pores; neutral (pH 7.2); abrupt wavy boundary.

2R-17 inches; quartzitic sandstone.

Typical Pedon Location

Map unit in which located: Vitale-Blackspar complex, 30 to 60 percent slopes

Location in survey area: About 2 miles east and 6 miles north of Fish Creek Reservoir; about 900 feet north and 400 feet east of the southwest corner of sec. 6, T. 2 N., R. 23 E.

Range in Characteristics

Depth to bedrock: 10 to 20 inches
Average annual soil temperature: 42 to 45 degrees F

A horizon:
Value-5 or 6 dry, 2 or 3 moist
Content of rock fragments-35 to 60 percent
Content of organic matter-1 to 2 percent

Bt horizon:
Hue-10YR or 7.5YR
Value-4 to 6 dry
Texture-very cobbly loam, very cobbly clay loam, or extremely cobbly loam
Content of clay-20 to 30 percent
Content of rock fragments-35 to 75 percent

Taxadjunct Feature

The Blackspar soils in this survey area at elevations above about 7,500 feet have cryic temperatures, which are outside the range for the series. This difference, however, does not significantly affect use and management.

Blackspot Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Position on landscape: Mountainsides
Parent material: Mixed colluvium over calcareous quartzitic residuum
Slope: 30 to 60 percent
Elevation: 4,700 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal, mixed, frigid (shallow) Haplic Durixerolls

Typical Pedon

A1-0 to 1 inch; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine tubular pores; about 35 percent pebbles and 5 percent cobbles; slightly effervescent (about 10 percent lime): mildly alkaline (pH 7.8); clear wavy boundary.

A2-1 to 7 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; about 5 percent cobbles and 40 percent pebbles; strongly effervescent (about 15 percent lime); moderately alkaline (pH 8.0); gradual wavy boundary.

Bk-7 to 11 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; about 5 percent cobbles and 45 percent pebbles; violently effervescent (about 30 percent lime); moderately alkaline (pH 8.2); clear wavy boundary.

Bqk-11 to 14 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; about 5 percent cobbles and 50 percent pebbles, including 10 percent duripan fragments; violently effervescent (about 35 percent lime); strongly alkaline (pH 8.6); abrupt wavy boundary.

2Bqkm-14 to 19 inches; white, indurated duripan, very pale brown (10YR 7/3) moist; massive; few fine roots on top of duripan; about 10 percent cobbles and 60 percent pebbles cemented in place; violently effervescent (about 35 percent lime); strongly alkaline (pH 8.8); abrupt broken boundary.

2R-19 inches; fractured, calcareous quartzite with 2Bqkm horizon material in fractures.

Typical Pedon Location

Map unit in which located: Blackspot-Prudy association, 30 to 60 percent slopes

Location in survey area: About 8 miles south and 3 miles east of Gannett; about 400 feet west and 1,200 feet south of the northeast corner of sec. 18, T. 2 S., R. 18 E.

Range in Characteristics

Average annual soil temperature: 42 to 45 degrees F

Thickness of mollic epipedon: 7 to 10 inches

Depth to duripan: 13 to 17 inches

Depth to bedrock: 19 to 22 inches

Other characteristics: Bqk horizon absent in some pedons

A horizon:
- Hue-10YR or 2.5Y
- Value-4 or 5 dry, 2 or 3 moist
- Content of pebbles-35 to 45 percent
- Content of cobbles-5 to 10 percent
- Content of clay-10 to 18 percent

Bk horizon:
- Hue-10YR or 2.5Y
- Value-6 or 7 dry, 4 or 5 moist
- Chroma-2 or 3 dry or moist
- Texture-very gravelly loam, extremely gravelly loam, or extremely gravelly sandy loam
- Content of pebbles-40 to 50 percent
- Content of cobbles-5 to 15 percent
- Content of clay-10 to 18 percent
- Reaction-moderately alkaline or strongly alkaline
- Effervescence-strongly effervescent or violently effervescent

Bqk horizon:
- Hue-10YR or 2.5Y
- Value-6 or 7 dry, 4 or 5 moist
- Chroma-2 or 3 dry or moist
- Texture-very gravelly loam, extremely gravelly loam, or extremely gravelly sandy loam
- Content of pebbles-40 to 55 percent
- Content of cobbles-5 to 15 percent
- Content of clay-10 to 18 percent
- Effervescence-strongly effervescent or violently effervescent
- Reaction-moderately alkaline or strongly alkaline

2Bqkm horizon.
- Value-7 or 8 dry, 6 or 7 moist
- Chroma-2 or 3 dry or moist
- Content of pebbles-50 to 60 percent
- Content of cobbles-5 to 10 percent
- Other characteristics-continuous laminar cap 1 to 3 millimeters thick

Bostrum Series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Very slow

Position on landscape: Basalt plains

Parent material: Residuum derived from basalt

Slope: 2 to 12 percent

Elevation: 4,600 to 4,900 feet

Average annual precipitation: 12 to 16 inches

Average annual air temperature: 45 to 50 degrees F

Frost-free period: 100 to 120 days

Taxonomic class: Fine, montmorillonitic, mesic Typic Palexeralfs

Typical Pedon

A-0 to 2 inches; grayish brown (10YR 5/2) cobbly silt loam, dark grayish brown (10YR 4/2) moist; moderate thin and medium platy structure parting to strong fine and medium granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; common fine vesicular pores; about 20 percent cobbles, 5 percent stones, and 5 percent pebbles; neutral (7.0); clear smooth boundary.

E-2 to 4 inches; pale brown (10YR 6/3) cobbly silt loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine, fine, and medium roots; many very fine and fine tubular pores; about 15 percent cobbles and 5 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Bt1-4 to 6 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 4/4) moist; moderate fine angular blocky structure; hard, friable, very sticky and very plastic; common very fine and fine roots; many very fine and fine tubular pores; about 10 percent pebbles; common moderately thick clay films on faces of peds and lining pores; neutral (pH 7.2); abrupt wavy boundary.

Bt2-6 to 20 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 4/4) moist; strong medium and coarse prismatic structure parting to strong fine and medium angular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine and fine tubular pores; about 5 percent pebbles; common moderately thick clay films on faces of peds and lining pores; mildly alkaline (pH 7.4); gradual wavy boundary.

Bt3-20 to 28 inches; brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; moderate medium and coarse prismatic structure parting to weak fine and medium angular blocky; very hard, firm, very sticky and very plastic; few fine roots; few very fine and fine tubular pores; about 5 percent pebbles; common moderately thick clay films on faces of peds and lining pores; mildly alkaline (pH 7.4); clear wavy boundary.

Btk-28 to 32 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; weak fine and medium angular blocky structure; hard, friable, sticky and plastic; few fine roots; few very fine and fine tubular pores; few moderately thick clay films on faces of peds and lining pores; about 5 percent pebbles; slightly effervescent (about 10 percent lime); mildly alkaline (pH 7.6); abrupt wavy boundary.

R-32 inches; lime-coated basalt.

Typical Pedon Location

Map unit in which located: Bostrum-Yutrue-Hamrub complex, 2 to 12 percent slopes

Location in survey area: About 3 miles south of Magic Reservoir; about 2,600 feet west and 350 feet south of the northeast corner of sec. 31, T. 2 S., R. 18 E.

Range in Characteristics

Average annual soil temperature: 47 to 52 degrees F

Depth to bedrock. 20 to 40 inches

A horizon:
- Value-5 or 6 dry, 3 or 4 moist
- Chroma-1 to 3 dry or moist
- Content of pebbles-5 to 10 percent
- Content of cobbles-15 to 20 percent
- Content of stones-0 to 5 percent

E horizon:
- Value-6 or 7 dry, 3 or 4 moist
- Chroma-1 to 3 dry or moist
- Content of pebbles-5 to 10 percent
- Content of stones-0 to 5 percent
- Content of cobbles-15 to 20 percent
- Content of clay-15 to 25 percent

Bt horizon:
- Value-4 to 6 dry, 3 or 4 moist
- Texture-silty clay, clay, or silty clay loam
- Content of pebbles-0 to 5 percent
- Content of clay-35 to 50 percent
- Reaction-neutral or mildly alkaline

Btk horizon:
- Value-4 to 6 dry, 3 to 5 moist
- Chroma-3 or 4 dry or moist
- Content of pebbles-0 to 5 percent
- Content of clay-30 to 40 percent
- Reaction-neutral to moderately alkaline

Bringmee Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately slow in the upper 47 inches; moderately rapid or rapid below this depth

Position on landscape: Fan terraces, stream terraces

Parent material: Alluvium derived from various kinds of rock

Slope: 0 to 8 percent
Elevation: 4,800 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 45 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-loamy, mixed, frigid Pachic Ultic Argixerolls

Typical Pedon

Ap-0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable; many very fine roots; many very fine and fine tubular pores; slightly acid (pH 6.2); clear smooth boundary.

BA-7 to 15 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; slightly acid (pH 6.4); clear smooth boundary.

Bt1-15 to 26 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; few thin clay films on faces of peds; about 10 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

Bt2-26 to 34 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; common thin clay films on faces of peds; about 14 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.

Bt3-34 to 47 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; few fine tubular pores; about 14 percent pebbles; few fine distinct relict mottles; neutral (pH 6.6); clear wavy boundary.

2C-47 to 61 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; few fine faint relict mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; about 30 percent pebbles; neutral (pH 6.8).

Typical Pedon Location

Map unit in which located: Bringmee loam, 4 to 8 percent slopes

Location in survey area: About 3.5 miles north and 4 miles east of Carey; about 2,500 feet west and 600 feet south of the northeast corner of sec. 5, T. 1 S., R. 22 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Depth to sand and gravel: 40 to 60 inches
Average annual soil temperature: 42 to 47 degrees F
Thickness of mollic epipedon: 20 to 36 inches
Reaction: Moderately acid to neutral
Base saturation in upper 75 centimeters: 50 to 75 percent

A horizon:
Value-3 or 4 dry, 2 or 3 moist
Chroma-1 or 2 dry or moist
Content of rock fragments-0 to 20 percent

Bt horizon:
Value-4 to 6 dry
Chroma-2 to 4 dry or moist
Texture-clay loam, sandy clay loam, loam
Content of rock fragments-5 to 15 percent
Content of clay-20 to 35 percent

2C horizon:
Value-5 to 7 dry, 4 or 5 moist
Chroma-3 or 4 dry or moist
Texture-gravelly sandy loam, very gravelly loamy coarse sand, or very gravelly loamy sand
Content of rock fragments-25 to 60 percent
Content of clay-0 to 15 percent

Bruneel Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate in the upper 23 inches; very rapid below this depth
Position on landscape: Flood plains
Parent material: Recent alluvium derived from various kinds of rock
Slope: 0 to 2 percent
Elevation: 4,700 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Coarse-loamy over sandy or sandy-skeletal, mixed, frigid Typic Haplaquolls

Typical Pedon

A1-0 to 7 inches; grayish brown (10YR 5/2) loam, very

dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; common fine tubular pores; slightly effervescent (10 percent lime); moderately alkaline (pH 7.9); clear wavy boundary.

A2-7 to 14 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; many fine faint yellowish brown (10YR 5/4) mottles, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; many fine tubular pores; mildly alkaline (pH 7.4); clear wavy boundary.

Bg-14 to 23 inches; light gray (2.5Y 6/0) loam, gray (2.5Y 5/0) moist; common fine faint yellowish brown (10YR 5/4) mottles, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; mildly alkaline (pH 7.4); clear wavy boundary.

2Cg1-23 to 27 inches; grayish brown (10YR 5/2) very gravelly loamy sand, dark brown (10YR 3/3) moist; few faint yellowish brown (10YR 5/4) mottles; massive; soft, very friable; few fine roots; few very fine tubular pores; about 50 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary.

2Cg2-27 to 61 inches; multicolored extremely gravelly coarse sand; single grain; loose; few fine roots; about 65 percent pebbles; mildly alkaline (pH 7.4).

Typical Pedon Location

Map unit in which located: Bruneel loam, 0 to 2 percent slopes

Location in survey area: About 6 miles south and 1 mile west of Bellevue; about 100 feet west and 1,100 feet south of the northeast corner of sec. 2, T. 1 S., R. 18 E.

Range in Characteristics

Depth to loose sand and gravel: 20 to 30 inches

Depth to seasonal high water table: 12 to 18 inches for more than 90 days consecutively

Thickness of mollic epipedon: 10 to 20 inches

Average annual soil temperature: 42 to 46 degrees F

Effervescence: Noneffervescent or slightly effervescent

Reaction: Neutral to moderately alkaline

A horizon:
- Value-4 or 5 dry, 2 or 3 moist
- Chroma-1 or 2 dry or moist

Bg horizon:
- Hue-1 0YR, 2.5Y, or neutral
- Value-4 to 6 dry, 3 to 5 moist
- Chroma-0 to 2 dry or moist
- Mottles-distinct or prominent
- Texture-loam or fine sandy loam
- Content of clay-10 to 18 percent
- Content of rock fragments-0 to 15 percent

2Cg horizon:
- Hue-10YR or 2.5Y
- Value-3 to 6 moist
- Chroma-0 to 2 dry or moist
- Texture-very gravelly loamy sand, extremely gravelly loamy sand, or extremely gravelly coarse sand
- Content of clay-0 to 5 percent
- Content of rock fragments-40 to 70 percent
- Content of cobbles-5 to 20 percent

Carey Lake Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately slow

Position on landscape: Fan terraces

Parent material: Alluvium derived from various kinds of rock

Slope: 0 to 4 percent

Elevation: 4,700 to 6,000 feet

Average annual precipitation: 12 to 16 inches

Average annual air temperature: 40 to 44 degrees F

Frost-free period: 60 to 90 days

Taxonomic class: Fine-loamy, mixed, frigid Pachic Argixerolls

Typical Pedon

Ap-0 to 8 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine interstitial pores; neutral (pH 7.2); clear wavy boundary.

A-8 to 12 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; neutral (pH 7.0); abrupt wavy boundary.

Bt-12 to 20 inches; grayish brown (10YR 5/2) clay loam, dark brown (10YR 3/3) moist; strong fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores;

few thin clay films on faces of peds and lining pores; neutral (pH 6.8); abrupt wavy boundary.

BC1-20 to 31 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly plastic; few very fine and fine roots; common fine tubular pores; neutral (pH 7.0); clear smooth boundary.

BC2-31 to 42 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; few fine and medium faint yellowish brown (10YR 5/6) relict mottles; weak medium subangular blocky structure; slightly hard, friable; few very fine and fine roots; common fine tubular pores; neutral (pH 7.2); clear smooth boundary.

2C1-42 to 47 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; many fine and medium prominent yellowish brown (10YR 5/6) relict mottles; massive; slightly hard, friable; few very fine and fine roots; few fine tubular pores; neutral (pH 7.2); gradual wavy boundary.

2C2-47 to 72 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; many fine and medium prominent yellowish brown (10YR 5/6) relict mottles; massive; slightly hard, friable; few very fine and fine roots; few fine tubular pores; neutral (pH 7.2).

Typical Pedon Location

Map unit in which located: Carey Lake loam, 0 to 2 percent slopes

Location in survey area: About 1.5 miles south and 0.5 mile east of Carey; about 50 feet west and 100 feet south of the northeast corner of sec. 3, T. 2 S., R. 21 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Average annual soil temperature: 42 to 47 degrees F
Thickness of mollic epipedon: 20 to 60 inches or more
Depth to base of argillic horizon: 20 to 28 inches

A horizon:
Value-2 or 3 dry or moist

Bt horizon:
Texture-loam, clay loam, or silt loam
Content of rock fragments-0 to 10 percent
Content of clay-22 to 33 percent

BC horizon:
Texture-fine sandy loam, loam, or clay loam
Content of rock fragments-0 to 10 percent
Content of clay-15 to 28 percent
Reaction-neutral or mildly alkaline

2C horizon:
Texture-very fine sandy loam, fine sandy loam, or loam
Content of rock fragments-0 to 14 percent
Reaction-neutral to moderately alkaline

Cinderhurst Series

Depth class: Very shallow
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Basalt plains
Parent material: Volcanic tephra
Slope. 2 to 15 percent
Elevation: 4,800 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal, mixed, frigid Lithic Mollic Haploxeralfs

Typical Pedon

A-0 to 3 inches; brown (10YR 4/3) extremely cobbly silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly plastic; common very fine and fine roots; many very fine interstitial pores; about 50 percent cobbles and 15 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

Bt-3 to 8 inches; yellowish brown (10YR 5/4) very cobbly silt loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, medium, and coarse roots; common very fine tubular pores; about 35 percent cobbles and 5 percent pebbles; thin clay films on sand grains; slightly acid (pH 6.4); abrupt smooth boundary.

2R-8 inches; basalt with vertical fractures 2 to 5 centimeters wide and 1 to 3 meters apart; Bt horizon material in fractures:, few very fine. fine, and medium roots in fractures.

Typical Pedon Location

Map unit in which located: Lava flows-Cinderhurst complex, 2 to 15 percent slopes

Location in survey area: About 15 miles east and 6 miles north of Carey; about 1,800 feet north and 50

feet west of the southeast corner of sec. 19, T. 1 N., R. 24 E.

Range in Characteristics

Depth to bedrock: 4 to 10 inches
Average annual soil temperature: 42 to 47 degrees F
Reaction: Slightly acid or neutral

A horizon:
Value-4 or 5 dry
Chroma-3 or 4 dry, 2 to 4 moist
Content of rock fragments-60 to 75 percent
Content of clay-15 to 20 percent

Bt horizon:
Hue-10YR or 7.5YR
Value-4 or 5 dry, 3 or 4 moist
Chroma-3 or 4 moist
Texture-very cobbly silt loam, very gravelly silt loam, or extremely cobbly loam
Content of rock fragments-40 to 70 percent
Content of clay-18 to 25 percent

Cox Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Position on landscape: Basalt plains
Parent material: Eolian material derived from various kinds of rock
Slope: 2 to 15 percent
Elevation: 4,600 to 5,000 feet
Average annual precipitation: 10 to 12 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 100 to 120 days
Taxonomic class: Loamy-skeletal, mixed, mesic Lithic Ultic Haploxerolls

Typical Pedon

A-0 to 3 inches; dark brown (10YR 4/3) very stony sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; many very fine, fine, and medium roots; many very fine interstitial pores; about 40 percent stones and 10 percent cobbles; slightly acid (pH 6.4); clear wavy boundary.

AB-3 to 7 inches; dark yellowish brown (10YR 4/4) very cobbly fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable; common very fine, fine, and medium roots; many very fine interstitial pores; about 40 percent cobbles and 10 percent stones; neutral (pH 6.6); clear wavy boundary.

Bw-7 to 12 inches; dark yellowish brown (10YR 4/4) very cobbly fine sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable; common very fine, fine, and medium roots; many very fine tubular pores; about 50 percent cobbles; neutral (pH 7.0); abrupt wavy boundary.

2R-12 inches; basalt.

Typical Pedon Location

Map unit in which located: Cox-Rehfield-Rock outcrop complex, 2 to 15 percent slopes
Location in survey area: About 22 miles east and 8 miles south of Carey; about 500 feet east and 400 feet north of the southwest corner of sec. 9, T. 2 S., R. 25 E.

Range in Characteristics

Depth to bedrock: 10 to 20 inches
Thickness of mollic epipedon: 8 to 12 inches
Average annual soil temperature: 47 to 52 degrees F
Base saturation above the lithic contact: Less than 75 percent
Other characteristics: AB horizon absent in some pedons

A horizon:
Value-4 or 5 dry Chroma-2 or 3 dry or moist

Bw horizon:
Value-4 or 5 dry, 3 or 4 moist
Texture-very cobbly fine sandy loam, very stony sandy loam, or extremely stony sandy loam
Content of rock fragments-35 to 60 percent
Content of clay-10 to 18 percent
Reaction-slightly acid to mildly alkaline

Deerhorn Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Basalt plains, sides of buttes
Parent material: Eolian material over basalt
Slope: 2 to 15 percent
Elevation: 4,600 to 5,000 feet
Average annual precipitation: 8 to 12 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 100 to 120 days

Taxonomic class: Fine-loamy, mixed, mesic Argic Durixerolls

Typical Pedon

A-0 to 9 inches; dark grayish brown (10YR 4/2) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable; many very fine and fine roots; common very fine interstitial pores; neutral (pH 7.0); clear wavy boundary.

Bt-9 to 17 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; mildly alkaline (pH 7.6); abrupt wavy boundary.

Bk-17 to 21 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; weak fine and medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; few very fine and fine tubular pores; mildly alkaline (pH 7.8); slightly effervescent (about 10 percent lime); abrupt wavy boundary.

2Bqkm-21 to 24 inches; very pale brown (10YR 7/3), indurated duripan; mildly alkaline (pH 7.8); violently effervescent (about 20 percent lime); abrupt wavy boundary.

2R-24 inches; fractured basalt.

Typical Pedon Location

Map unit in which located: Deerhorn-Wildors complex, 2 to 8 percent slopes

Location in survey area: About 19 miles east and 6 miles south of Carey; about 2,600 feet east and 800 feet south of the northwest corner of sec. 33, T. 2 S., R. 24 E.

Range in Characteristics

Depth to bedrock: 22 to 35 inches
Depth to duripan: 20 to 30 inches
Average annual soil temperature: 47 to 52 degrees F

A horizon:
Value-4 or 5 dry, 2 or 3 moist

Bt horizon:
Hue-10YR or 7.5YR
Chroma-2 or 3 dry or moist
Texture-sandy clay loam, sandy loam, or loam
Content of clay-18 to 30 percent

2Bqkm horizon:
Hue-10YR or 7.5YR
Value-7 or 8 dry, 6 or 7 moist
Chroma-3 or 4 moist

Dollarhide Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately rapid
Position on landscape: Mountainsides, ridges
Parent material: Colluvium and volcanic tephra influenced colluvium derived from quartzitic sandstone and related rock
Slope: 30 to 75 percent
Elevation: 5,200 to 9,250 feet
Average annual precipitation: 16 to 24 inches
Average annual air temperature: 36 to 41 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Loamy-skeletal, mixed Lithic Cryoborolls

Typical Pedon

A-0 to 7 inches; brown (10YR 5/3) very gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; many very fine, fine, and medium roots; many very fine and fine interstitial pores; about 40 percent pebbles and 10 percent cobbles; neutral (pH 6.8); clear wavy boundary.

Bw-7 to 13 inches; yellowish brown (10YR 5/4) extremely cobbly fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable; common very fine roots; many very fine and fine interstitial pores; about 50 percent cobbles and 15 percent pebbles; neutral (pH 7.0); abrupt *wavy* boundary.

2R1-13 to 23 inches; fractured quartzite; vertical and horizontal fractures 1 to 2 millimeters wide; soil material in less than 5 percent of fractures; common very fine and fine roots along fracture planes.

2R2-23 inches; quartzite that is not fractured.

Typical Pedon Location

Map unit in which located: Ketchum-Dollarhide complex, 30 to 60 percent slopes

Location in survey area: About 1 mile northeast of Bell Mountain Lookout; about 2,500 feet north and 2,500 feet east of the southwest corner of sec. 7, T. 1 N., R. 20 E.

Range in Characteristics

Depth to bedrock: 10 to 20 inches

Thickness of mollic epipedon: 7 to 10 inches
Content of clay in textural control section: 8 to 18 percent
Average annual soil temperature: 39 to 43 degrees F
Average summer soil temperature: 54 to 59 degrees F

A horizon:
Value-3 or 4 moist
Content of rock fragments-35 to 60 percent
Reaction-neutral or mildly alkaline

Bw horizon:
Value-3 or 4 moist
Texture-extremely cobbly fine sandy loam or extremely cobbly loam
Content of rock fragments-60 to 75 percent
Reaction-neutral or mildly alkaline

Drage Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Fan terraces, stream terraces
Parent material: Alluvium derived from various kinds of igneous and metamorphic rock
Slope: 1 to 15 percent
Elevation: 4,800 to 6,100 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 45 degrees F
Frost-free period: 60 to *90* days
Taxonomic class: Loamy-skeletal, mixed, frigid Calcic Argixerolls

Typical Pedon

A-0 to 8 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; about 16 percent pebbles; neutral (pH 6.8); abrupt smooth boundary.

BA-8 to 14 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, friable, sticky and plastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; about 16 percent pebbles; few thin clay films on faces of peds and lining pores; neutral (pH 6.8); clear smooth boundary,

Bt1-14 to 25 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; many very fine and fine interstitial pores; about 35 percent pebbles; many thin clay films on faces of peds and lining pores; neutral (pH 7.0); gradual wavy boundary.

Bt2-25 to 30 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; many very fine and fine interstitial pores; about 40 percent pebbles and 10 percent cobbles; many thin clay films on faces of peds and lining pores; neutral (pH 7.2); gradual wavy boundary.

Bk-30 to 61 inches; very pale brown (10YR 7/4) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, friable; few very fine and fine roots; about 50 percent pebbles and 15 percent cobbles; violently effervescent (about 10 percent lime); mildly alkaline (pH 7.6).

Typical Pedon Location

Map unit in which located: Drage gravelly loam, cool, 2 to 15 percent slopes
Location in survey area: About 4 miles north and 2 miles east of Hailey; about 1,200 feet north and 3,400 feet east of the southwest corner of sec. 16, T. 3 N., R. 18 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Thickness of mollic epipedon: 10 to 17 inches
Depth to lime accumulation: 25 to 45 inches
Average annual soil temperature: 42 to 46 degrees F
Other characteristics: BA horizon absent in some pedons

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Content of rock fragments-15 to 55 percent
Reaction-neutral or mildly alkaline

Bt horizon:
Value-4 or 5 dry, 3 or 4 moist
Chroma-3 or 4 dry or moist
Texture-very gravelly clay loam or very gravelly sandy clay loam
Content of rock fragments-35 to 60 percent
Content of clay-28 to 35 percent
Reaction-neutral or mildly alkaline

Bk horizon:
Value-6 or 7 dry, 5 or 6 moist
Chroma-3 or 4 dry or moist
Texture-extremely gravelly loam, extremely gravelly sandy loam, or extremely cobbly sandy loam
Content of rock fragments-60 to 75 percent
Reaction-mildly alkaline or moderately alkaline

Taxadjunct Feature

The Drage soils in this survey area at elevations above about 6,000 feet have cryic temperatures, which are outside the range for the series. This difference, however, does not significantly affect use and management.

Earcree Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Positions on landscape: Mountainsides, foothills
Parent material: Colluvium and alluvium over residuum derived from granite
Slope: 8 to 60 percent
Elevation: 5,000 to 8,200 feet
Average annual precipitation: 16 to 20 inches
Average annual air temperature: 36 to 41 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Coarse-loamy, mixed Pachic Cryoborolls

Typical Pedon

A1-0 to 12 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, black (10YR 2/1) moist; weak fine and medium granular structure; soft, very friable; many very fine, fine, and medium roots; many very fine interstitial pores; about 30 percent pebbles; neutral (pH 6.6); clear wavy boundary.
A2-12 to 24 inches; brown (10YR 4/3) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable; many very fine, fine, and medium roots; common very fine and fine interstitial pores; about 30 percent pebbles; neutral (pH 6.6); abrupt wavy boundary.
A3-24 to 37 inches; brown (10YR 5/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; massive; loose, friable; common very fine, fine, and medium roots; many *very* fine interstitial pores; about 30 percent pebbles; neutral (pH 6.8); clear wavy boundary.
C1-37 to 52 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; massive; loose; few very fine, fine, and medium roots; many very fine interstitial pores; about 34 percent pebbles; neutral (pH 6.8); diffuse irregular boundary.
C2-52 to 70 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, brown (10YR 5/3) moist; massive; loose; few very fine, fine, and medium roots; many very fine pores; about 55 percent pebbles; neutral (pH 6.6).

Typical Pedon Location

Map unit in which located: Earcree-Moonstone association, 30 to 60 percent slopes
Location in survey area: About 1 mile south and 12 miles west of Bellevue; about 2,560 feet east and 2,200 feet south of the northwest corner of sec. 2, T. 1 N., R. 16 E.

Range in Characteristics

Thickness of mollic epipedon: 30 to 50 inches
Depth to bedrock: More than 60 inches
Content of clay in control section: 10 to 18 percent
Content of rock fragments: 5 to 35 percent
Reaction: Moderately acid to neutral
Average annual soil temperature: 39 to 43 degrees F

A horizon:
Value-3 to 5 dry

C horizon:
Hue-10YR to 5Y
Value-5 to 7 dry, 4 to 6 moist
Chroma-2 to 4 dry or moist
Texture-gravelly coarse sandy loam, gravelly sandy loam, or very gravelly loamy coarse sand
Content of rock fragments-30 to 45 percent

Elkcreek Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Foothills, mountainsides
Parent material: Residuum derived from andesite and basalt
Slope: 4 to 60 percent
Elevation: 4,800 to 6,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 45 degrees F
Frost-free period: 60 to 90 days

Taxonomic class: Fine-loamy, mixed, frigid Ultic Argixerolls

Typical Pedon

A1-0 to 6 inches; grayish brown (10YR 5/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly plastic; many fine, medium, and coarse roots; many very fine and fine interstitial pores; neutral (pH 6.8); gradual wavy boundary.

A2-6 to 11 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; neutral (pH 7.0); clear wavy boundary.

Bt1-11 to 18 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong fine and medium angular blocky structure; very firm, sticky and plastic; common very fine, fine, medium, and coarse roots; many fine and very fine interstitial pores; neutral (pH 7.2); gradual wavy boundary.

Bt2-18 to 28 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong medium and coarse angular blocky structure; very hard, very firm, sticky and plastic; common very fine, fine, medium, and coarse roots; many fine and very fine interstitial pores; neutral (pH 7.2); gradual wavy boundary.

BC-28 to 34 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; massive parting to weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine, fine, medium, and coarse roots; neutral (pH 7.2); abrupt wavy boundary.

R-34 inches; fractured basalt.

Typical Pedon Location

Map unit in which located: Elkcreek-Polecreek complex, 4 to 30 percent slopes

Location in survey area: About 8 miles south and 8 miles west of Bellevue; about 2,400 feet east and 300 feet south of the northwest corner of sec. 11, T. 1 S., R. 17 E.

Range in Characteristics

Thickness of mollic epipedon: 10 to 16 inches
Depth to bedrock: 26 to 40 inches
Average annual soil temperature: 42 to 46 degrees F
Reaction: Slightly acid, neutral
Base saturation: 50 to 75 percent

Other characteristics: AB horizon present in some pedons

A horizon:
Value-4 or 5 dry
Chroma-1 to 3 dry or moist
Content of rock fragments-0 to 15 percent

Bt horizon:
Hue-10YR or 7.5YR
Value-3 to 5 moist
Chroma-2 to 4 dry or moist
Texture-clay loam or sandy clay loam
Content of clay-20 to 35 percent
Content of rock fragments--5 to 15 percent

BC horizon:
Value-5 or 6 dry
Texture-loam or clay loam
Content of rock fragments-5 to 20 percent

Elksel Series

Depth class: Deep
Drainage class: Well drained
Permeability: Slow
Position on landscape: Mountainsides
Parent material: Colluvium and residuum derived from andesite, latite, basalt, and rhyolite
Slope: 30 to 60 percent
Elevation: 4,700 to 7,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Clayey-skeletal, montmorillonitic, frigid Ultic Argixerolls

Typical Pedon

A1-0 to 3 inches; grayish brown (10YR 5/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; common very fine, fine, and medium roots; many very fine interstitial pores; about 25 percent cobbles and 10 percent pebbles; neutral (pH 6.6); clear wavy boundary.

A2-3 to 10 inches; dark grayish brown (10YR 4/2) very cobbly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine interstitial pores; about 35 percent cobbles and 5 percent pebbles; neutral (pH 6.8); abrupt wavy boundary.

AB-10 to 13 inches; dark grayish brown (10YR 4/2) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, firm, sticky and plastic; few very fine roots; many very fine interstitial pores; about 40 percent cobbles and 10 percent pebbles; few thin clay films in pores; neutral (pH 6.8); abrupt wavy boundary.

Bt1-13 to 17 inches; brown (10YR 5/3) very cobbly clay, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; about 45 percent cobbles and 10 percent pebbles; common moderately thick clay films in pores; neutral (pH 7.0); clear wavy boundary.

Bt2-17 to 33 inches; yellowish brown (10YR 5/4) extremely cobbly clay, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine tubular pores; about 60 percent cobbles and 10 percent pebbles; many thick clay films in pores; neutral (pH 7.2); gradual irregular boundary.

Bt3-33 to 45 inches; yellowish brown (10YR 5/4) extremely cobbly sandy clay, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine tubular pores; about 60 percent cobbles and 15 percent pebbles; many thick clay films in pores; neutral (pH 7.2); gradual irregular boundary.

R-45 inches; fractured andesite; fractures 1 to 4 millimeters wide; Bt3 horizon material in fractures; few very fine roots in fractures.

Typical Pedon Location

Map unit in which located: Elksel-Friedman-Starhope complex, 30 to 60 percent slopes

Location in survey area: About 2 miles east and 4 miles north of Carey; about 800 feet west and 100 feet south of the northeast corner of sec. 35, T. 1 N., R. 21 E.

Range in Characteristics

Depth to bedrock: 40 to 60 inches

Average annual soil temperature: 42 to 46 degrees F

Base saturation in upper 75 centimeters. 50 to 75 percent

Other characteristics: AB horizon absent in some pedons, Bqm horizon present below a depth of 40 inches in some pedons

Bt horizon:

Hue-10YR or 7.5YR

Value-3 to 5 dry, 3 or 4 moist

Texture-very cobbly clay loam, very cobbly clay, extremely cobbly clay, extremely cobbly sandy clay, very gravelly clay, or extremely gravelly clay

Content of rock fragments-35 to 80 percent

Content of clay-35 to 55 percent

Friedman Series

Depth class: Deep

Drainage class: Well drained

Permeability: Slow

Position on landscape: Mountainsides

Parent material: Colluvium derived from latite, andesite, and welded tuff

Slope: 30 to 60 percent

Elevation: 5,000 to 8,000 feet

Average annual precipitation: 16 to 22 inches

Average annual air temperature: 36 to 41 degrees F

Frost-free period: Less than 60 days

Taxonomic class: Clayey-skeletal, montmorillonitic Argic Pachic Cryoborolls

Typical Pedon

A1-0 to 5 inches; dark brown (10YR 3/3) cobbly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many fine and very fine interstitial pores; about 10 percent cobbles and 5 percent pebbles; neutral (pH 6.6); gradual wavy boundary.

A2-5 to 17 inches; dark brown (10YR 3/3) gravelly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, firm, sticky and plastic; many very fine, fine, medium, and coarse roots; many fine and very fine interstitial pores; about 15 percent pebbles and 5 percent cobbles; neutral (pH 6.8); gradual wavy boundary.

BA-17 to 24 inches; brown (10YR 4/3) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common very fine, fine, medium, and coarse roots; many fine and very fine interstitial and tubular pores; about 20 percent pebbles and 10 percent cobbles; slightly acid (pH 6.4); clear wavy boundary.

Bt1-24 to 36 inches; dark yellowish brown (10YR 4/4) very gravelly clay, dark brown (10YR 3/3) moist; strong fine and medium subangular blocky structure; very hard, very firm, very sticky and very plastic; common very fine, fine, medium, and coarse roots; common fine and very fine tubular pores; common moderately thick clay films on faces of peds; about 35 percent pebbles and 10 percent cobbles; neutral (pH 6.8); clear wavy boundary.

Bt2-36 to 47 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 3/4) moist; strong fine and medium subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine, fine, medium, and coarse roots; common fine and very fine tubular pores; common moderately thick clay films on faces of peds; about 30 percent pebbles and 5 percent cobbles; slightly acid (pH 6.8); abrupt wavy boundary.

Bt3-47 to 54 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark yellowish brown (10YR 3/6) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine, fine, medium, and coarse roots; few fine and very fine tubular pores; few thin clay films on faces of peds; about 25 percent pebbles and 15 percent cobbles; neutral (pH 7.0); diffuse irregular boundary.

2R-54 inches; partially weathered latite.

Typical Pedon Location

Map unit in which located: Friedman-Elksel-Winridge complex, 30 to 60 percent slopes

Location in survey area: About 5.5 miles north and 2.5 miles west of Carey; about 1,000 feet east and 800 feet south of the northwest corner of sec. 14, T. 1 N., R. 21 E.

Range in Characteristics

Depth to bedrock: 40 to 60 inches
Thickness of mollic epipedon: 16 to 40 inches
Average annual soil temperature: 39 to 43 degrees F
Average summer soil temperature: 54 to 59 degrees F
Content of rock fragments in control section: 35 to 60 percent

A horizon:
Value-3 to 5 dry, 2 or 3 moist
Chroma-1 to 3 dry or moist
Organic matter content-3 to 5 percent
Content of rock fragments-15 to 30 percent

BA horizon:
Value-3 to 5 dry, 2 or 3 moist
Chroma-1 to 3 dry or moist
Content of rock fragments-15 to 30 percent
Texture-gravelly clay loam or gravelly loam

Bt1 and Bt2 horizon:
Hue-10YR or 7.5YR
Value-4 to 6 dry, 3 or 4 moist
Chroma-2 to 4 dry or moist
Content of rock fragments-35 to 60 percent
Content of clay-35 to 45 percent
Texture-very gravelly clay or very gravelly clay loam

Bt3 horizon:
Hue-10YR or 7.5YR
Value-4 to 6 dry, 3 or 4 moist
Chroma-2 to 6 dry or moist
Content of rock fragments-35 to 60 percent
Content of clay-20 to 25 percent

Furshur Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Very slow
Position on landscape: Mountainsides, undulating ridges
Parent material: Residuum and slope alluvium derived from rhyolite
Slope: 2 to 60 percent
Elevation: 4,700 to 5,600 feet
Average annual precipitation: 12 to 14 inches
Average annual air temperature: 40 to 45 degrees F
Frost-free period: 70 to 100 days
Taxonomic class: Clayey, montmorillonitic, frigid, shallow Abruptic Durixeralfs

Typical Pedon

A-0 to 2 inches; dark grayish brown (10YR 4/2) very channery loam, very dark grayish brown (10YR 3/2) moist; moderate medium, thick, and very thick platy structure; hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine, fine, and medium tubular pores; about 40 percent channers; neutral (pH 6.8); clear smooth boundary.

BA-2 to 5 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many very fine, fine, and medium roots; common fine tubular pores; few thin clay films lining pores and on faces of peds; 15 percent pebble-

sized pan fragments; about 5 percent pebbles and 5 percent cobbles; neutral (pH 7.0); abrupt wavy boundary.

Bt1-5 to 13 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; very hard, firm, very sticky and very plastic; common very fine and fine roots and few medium and coarse roots; few fine tubular pores; continuous thick clay films lining pores and on faces of peds; 5 percent pebbles and 5 percent cobbles; neutral (pH 7.0); clear wavy boundary.

Bt2-13 to 15 inches; brownish yellow (10YR 6/6) gravelly clay, yellowish brown (10YR 5/6) moist; moderate medium angular blocky structure; very hard, very firm, very sticky and very plastic; common very fine and few medium roots; few fine tubular pores; many moderately thick clay films lining pores and on faces of peds; 20 percent pebbles and 10 percent cobbles; neutral (pH 7.2); abrupt smooth boundary.

Bqkm-15 to 20 inches; very pale brown (10YR 8/3), indurated duripan; few very fine and fine roots matted on top of horizon; continuous laminar cap 1 to 3 millimeters thick at a depth of 15 inches; slightly effervescent (about 10 percent lime); mildly alkaline (pH 7.8); abrupt smooth boundary.

R-20 inches; fractured, layered rhyolitic bedrock; lime and silica in fractures.

Typical Pedon Location

Map unit in which located: Elksel-Peevywell-Furshur complex, 30 to 60 percent slopes

Location in survey area: About 2 miles southeast of the junction of U.S. Highways 93 and 20; about 1,700 feet west and 1,500 feet north of the southeast corner of sec. 25, T. 1 S., R. 18 E.

Range in Characteristics

Depth to bedrock: 18 to 24 inches
Depth to duripan: 14 to 20 inches
Average annual soil temperature: 42 to 47 degrees F

A horizon:
Value-4 or 5 dry Chroma-2 or 3 dry or moist

BA horizon:
Chroma-3 or 4 dry

Bt horizon:
Hue-7.5YR or 10YR
Value-5 or 6 dry
Chroma-4 to 6 moist
Content of rock fragments-5 to 30 percent
Content of clay-50 to 60 percent
Texture-clay or gravelly clay

Bqkm horizon:
Hue-7.5YR or 10YR Value-7 or 8 dry, 5 to 8 moist
Chroma-1 to 4 dry, 2 to 4 moist
Reaction-mildly alkaline or moderately alkaline

Gaib Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Foothills, mountainsides
Parent material: Residuum derived from andesite, latite, and basalt
Slope: 4 to 60 percent
Elevation: 4,800 to 7,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 *to* 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal, mixed, frigid Lithic Ultic Argixerolls

Typical Pedon

A-0 to 5 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky; common very fine and fine roots; many fine and medium tubular pores; about 25 percent pebbles and 10 percent cobbles; moderately acid (pH 6.0); clear smooth boundary.

Bt-5 to 13 inches; dark yellowish brown (10YR 4/4) very cobbly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; many fine and medium tubular pores; few thin clay films on faces of peds; about 10 percent pebbles and 30 percent cobbles; neutral (pH 6.8); abrupt smooth boundary.

R-13 inches; fractured basalt.

Typical Pedon Location

Map unit in which located: Gaib-Rock outcrop complex, 30 to 60 percent slopes

Location in survey area: About 3 miles southwest of Hailey; about 800 feet west and 300 feet south of the northeast corner of sec. 24, T. 2 N., R. 17 E.

Range in Characteristics

Depth to bedrock: 10 to 20 inches
Thickness of mollic epipedon: 7 to 12 inches
Average annual soil temperature: 42 to 46 degrees F
Reaction: Moderately acid to neutral
Base saturation: 50 to 75 percent

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist

Bt horizon:
Hue-7.5YR or 10YR
Value-4 or 5 dry, 3 or 4 moist
Chroma-2 to 4 dry or moist
Texture-very cobbly clay loam or very stony sandy clay loam
Content of rock fragments-35 to 60 percent
Content of clay-24 to 35 percent

Gimlett Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 27 inches; very rapid below this depth
Position on landscape: Stream terraces
Parent material: Alluvium derived from various kinds of rock
Slope: 0 to 2 percent
Elevation: 5,300 to 6,000 feet
Average annual precipitation: 16 to 18 inches
Average annual air temperature: 39 to 42 degrees F
Frost-free period: 60 to 75 days
Taxonomic class: Loamy-skeletal, mixed, frigid Pachic Ultic Haploxerolls

Typical Pedon

A1-0 to 3 inches; very dark grayish brown (10YR 3/2) very gravelly sandy loam, very dark brown (10YR 2/2) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine interstitial pores; about 45 percent pebbles; slightly acid (pH 6.1); clear smooth boundary.

A2-3 to 9 inches; very dark grayish brown (10YR 3/2) very gravelly loam, very dark brown (10YR 2/2) moist; weak very fine and fine subangular blocky structure parting to moderate very fine and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine interstitial pores; about 50 percent pebbles; moderately acid (pH 6.0); clear wavy boundary.

AB-9 to 18 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak very fine and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; common very fine and fine interstitial pores and few very fine and fine tubular pores; about 45 percent pebbles; moderately acid (pH 6.0); clear wavy boundary.

Bw1-18 to 27 inches; dark brown (10YR 4/3) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common *very* fine, fine, medium, and coarse roots; common very fine and fine interstitial pores and few very fine and fine tubular pores; about 45 percent pebbles and 5 percent cobbles; moderately acid (pH 5.8); gradual wavy boundary.

2Bw2-27 to 33 inches; yellowish brown (10YR 5/4) extremely cobbly sandy loam, dark yellowish brown (10YR 3/6) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; common very fine and fine interstitial pores; about 25 percent pebbles, 40 percent cobbles, and 5 percent stones; moderately acid (pH 5.8); clear wavy boundary.

2Bw3-33 to 38 inches; yellowish brown (10YR 5/4) extremely cobbly loamy coarse sand, dark yellowish brown (10YR 3/6) moist; weak fine subangular blocky structure; loose; common very fine, fine, and medium roots; common very fine and fine interstitial pores; about 25 percent pebbles, 40 percent cobbles, and 5 percent stones; moderately acid (pH 5.8); clear wavy boundary.

2Bw4-38 to 49 inches; brown (10YR 5/3) extremely cobbly coarse sand, dark yellowish brown (10YR 3/6) moist; single grain; loose; common very fine, fine, and medium roots; many very fine and fine interstitial pores; about 25 percent pebbles, 40 percent cobbles, and 10 percent stones; moderately acid (pH 5.7); gradual wavy boundary.

2Bq-49 to 63 inches; brown (10YR 5/3) extremely cobbly coarse sand, dark yellowish brown (10YR 3/4) moist; single grain; loose; few very fine, fine, and medium roots; many very fine, fine, and medium interstitial pores; white (10YR 8/2) silica coatings on undersides of coarse fragments; about

25 percent pebbles, 40 percent cobbles, and 10 percent stones; moderately acid (pH 6.0).

Typical Pedon Location

Map unit in which located: Gimlett very gravelly sandy loam, 0 to 2 percent slopes
Location in survey area: About 3/4 mile north and 3/4 mile west of Ketchum; about 2,150 feet east and 950 feet north of the southwest corner of sec. 12, T. 4 N., R. 17 E.

Range in Characteristics

Depth to cobbles and stones: 22 to 40 inches
Thickness of mollic epipedon: 20 to 27 inches
Reaction: Moderately acid to neutral
Average annual soil temperature: 41 to 44 degrees F

A1 horizon:
Value-3 to 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Content of rock fragments-35 to 60 percent

A2 and AB horizons.
Value-3 to 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Texture-very gravelly sandy loam, very gravelly loam, or *very* gravelly sandy clay loam
Content of rock fragments-35 to 60 percent
Content of clay-14 to 19 percent

Bw and 2Bw horizons:
Value-5 or 6 dry, 3 or 4 moist
Chroma-4 to 6 dry or moist
Texture-extremely cobbly sandy loam, extremely cobbly loamy sand, extremely cobbly loamy coarse sand, or extremely cobbly coarse sand
Content of rock fragments-60 to 85 percent
Content of clay-8 to 15 percent

2Bq horizon:
Value-5 or 6 dry, 2 or 3 moist
Chroma-3 to 6 dry or moist
Texture-extremely cobbly loamy coarse sand or extremely cobbly coarse sand
Content of rock fragments-60 to 85 percent
Content of clay-0 to 8 percent
Other characteristics-weak accumulations of lime on undersides of coarse fragments in some pedons

Gooding Series

Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Position on landscape: Basalt plains
Parent material: Alluvium over basalt or rhyolite
Slope: 2 to 20 percent
Elevation: 4,600 to 5,300 feet
Average annual precipitation: 10 to 13 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 90 to 110 days
Taxonomic class: Fine, montmorillonitic, mesic Xerollic Paleargids

Typical Pedon

A1-0 to 2 inches; brown (10YR 5/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; about 5 percent pebbles; neutral (pH 7.2); clear broken boundary.
A2-2 to 7 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium and thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; about 5 percent pebbles; neutral (pH 7.2); gradual wavy boundary.
E-7 to 9 inches; pale brown (10YR 6/3) silt loam, brown (10YR 5/3) moist; moderate fine and medium angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots, most of which are concentrated at lower boundary; many very fine and fine tubular pores; common bleached silt and sand particles on faces of peds; about 5 percent pebbles; neutral (pH 7.0); abrupt smooth boundary.
Bt1-9 to 15 inches; yellowish brown (10YR 5/4) silty clay, brown (10YR 4/3) moist; strong medium prismatic structure; very hard, very firm, very sticky and very plastic; common very fine and fine roots; common very fine and fine tubular pores; continuous thick clay films lining pores and on faces of peds; about 5 percent pebbles; neutral (pH 7.2); gradual smooth boundary.
Bt2-15 to 23 inches; yellowish brown (10YR 5/4) silty clay, brown (10YR 4/3) moist; strong medium and coarse angular blocky structure; extremely hard, very firm, very sticky and very plastic; few fine and medium roots; common very fine and fine tubular pores; continuous thick clay films lining pores and on faces of peds; about 5 percent pebbles; mildly alkaline (pH 7.4); gradual wavy boundary.
Bt3-23 to 34 inches; pale brown (10YR 6/3) silty clay, brown (10YR 4/3) moist; strong medium and coarse

angular blocky structure; very hard, firm, very sticky and very plastic; few fine roots; common very fine and fine tubular pores; many moderately thick clay films lining pores and on faces of peds; about 5 percent pebbles; mildly alkaline (pH 7.4); gradual wavy boundary.

Btk-34 to 44 inches; very pale brown (10YR 8/4) silty clay loam, light yellowish brown (10YR 6/4) moist; moderate medium and coarse angular blocky structure; hard, firm, very sticky and very plastic; few fine roots; many very fine and fine tubular pores; common moderately thick clay films lining pores and on faces of peds; strongly effervescent (about 10 percent lime); mildly alkaline (pH 7.6); clear wavy boundary.

Bk-44 to 49 inches; very pale brown (10YR 7/4) silty clay loam, strong brown (7.5YR 5/6) moist; moderate thin and medium platy structure; hard, firm, sticky and plastic; few fine and medium roots matted on top of duripan; few very fine and fine tubular pores; violently effervescent (about 30 percent lime); moderately alkaline (pH 8.0); abrupt smooth boundary.

Bqkm-49 to 62 inches; very pale brown (10YR 7/4) weakly cemented duripan; massive; extremely hard, extremely firm; many very fine and fine discontinuous tubular pores filled with lime and silica; plates cemented with lime and silica; violently effervescent (about 30 percent lime); moderately alkaline (pH 8.2); abrupt smooth boundary.

2R-62 inches; basalt that has a silica cap.

Typical Pedon Location

Map unit in which located: Gooding-Gooding, eroded-Hamrub complex, 2 to 12 percent slopes

Location in survey area: About 3 miles east of Magic Reservoir Dam; about 1,200 feet west and 1,200 feet north of the southeast corner of sec. 14, T. 2 S., R. 18 E.

Range in Characteristics

Depth to bedrock: 48 to 72 inches
Depth to duripan: 40 to 60 inches
Average annual soil temperature: 47 to 52 degrees F
Other characteristics: A/E horizon in some pedons

A horizon:
Value-4 or 5 dry, 2 or 3 moist

E horizon:
Value-5 to 7 dry, 3 to 5 moist

Bt and Btk horizons:
Hue-10YR or 7.5YR
Value-4 to 8 dry, 3 to 5 moist
Chroma-2 to 4 dry or moist
Texture-silty clay, clay, or silty clay loam
Content of clay-35 to 59 percent
Other characteristics-15 to 25 percent more clay in the upper 2.5 centimeters of the Bt horizon than in the E horizon

Bk horizon:
Texture-silty clay loam or clay loam

Bqkm horizon:
Hue-10YR or 7.5YR
Value-4 to 7 dry
Chroma-3 or 4 dry
Content of lime-15 to 40 percent
Thickness of plates-2 to 10 millimeters
Vertical distance between plates-3 to 12 centimeters

Goodington Series

Depth class: Deep
Drainage class: Well drained
Permeability: Very slow
Position on landscape: Basalt plains
Parent material: Loess over residuum derived from basalt
Slope: 2 to 20 percent
Elevation: 4,800 to 6,200 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 45 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine, montmorillonitic, frigid Typic Palexerolls

Typical Pedon

A1-0 to 6 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; neutral (pH 6.8); clear smooth boundary.

A2-6 to 10 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; neutral (pH 6.6); clear smooth boundary.

BA-10 to 12 inches; brown (7.5YR 4/2) silty clay loam, dark brown (7.5YR 3/2) moist; moderate fine subangular blocky structure; hard, firm, sticky and

plastic; common fine roots; many fine tubular pores; pale brown (10YR 6/3) silt coatings on faces of peds; slightly acid (pH 6.4); abrupt smooth boundary.

Bt1-12 to 18 inches; brown (7.5YR 5/4) silty clay, dark brown (7.5YR 4/4) moist; strong medium prismatic structure; very hard, very firm, very sticky and very plastic; few fine roots; many fine tubular pores; many slickensides on faces of peds; slightly acid (pH 6.2); clear smooth boundary.

Bt2-18 to 26 inches; brown (7.5YR 5/4) silty clay, dark brown (7.5YR 4/4) moist; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine roots; common fine tubular pores; continuous thick clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

Bt3-26 to 34 inches; brown (7.5YR 5/4) silty clay loam, dark brown (7.5YR 4/4) moist; moderate medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine roots; common fine tubular pores; continuous moderately thick clay films on faces of peds; moderately alkaline (pH 8.2); clear smooth boundary.

Bk-34 to 56 inches; pinkish gray (7.5YR 6/2) silty clay loam, dark brown (7.5YR 4/2) moist; moderate medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine tubular pores; nearly continuous pinkish white (7.5YR 8/2) lime coatings on faces of peds and in pores; strongly effervescent (about 20 percent lime); moderately alkaline (pH 8.4); clear smooth boundary.

R-56 inches; hard, lime-coated basalt.

Typical Pedon Location

Map unit in which located: Goodington silt loam, 2 to 4 percent slopes

Location in survey area: About 6 miles east and 6 miles north of Carey; about 2,200 feet west and 2,000 feet north of the southeast corner of sec. 15, T. 1 N., R. 22 E.

Range in Characteristics

Depth to bedrock: 40 to 60 inches
Thickness of mollic epipedon: 10 to 15 inches
Average annual soil temperature: 42 to 47 degrees F

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Content of clay-15 to 25 percent
Reaction-slightly acid or neutral

Bt1 and Bt2 horizons:
Hue-7.5YR or 10YR
Value-4 or 5 dry, 3 or 4 moist
Chroma-2 to 4 dry or moist
Texture-silty clay or clay
Content of clay-40 to 55 percent
Absolute clay increase-20 percent in upper 7.5 centimeters
Reaction-neutral to moderately alkaline

Bt3 and Bk horizons:
Hue-7.5YR or 10YR
Value-5 or 6 dry, 3 or 4 moist
Chroma-2 to 4 dry or moist
Texture-silt loam or silty clay loam
Content of clay-25 to 40 percent
Content of rock fragments-0 to 10 percent
Reaction-mildly alkaline or moderately alkaline

Hamrub Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Basalt plains
Parent material: Loess over alluvium
Slope: 2 to 12 percent
Elevation: 4,600 to 4,800 feet
Average annual precipitation: 11 to 13 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 90 to 110 days
Taxonomic class: Fine-silty, mixed, mesic Aridic Calcic Argixerolls

Typical Pedon

A1-0 to 2 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak thin platy structure parting to moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots and few coarse roots; many very fine and fine tubular pores; neutral (pH 7.0); clear smooth boundary.

A2-2 to 5 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots and few coarse roots; many very fine and fine tubular pores; neutral (pH 7.2); clear wavy boundary.

BA-5 to 10 inches; yellowish brown (10YR 5/4) silt loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard,

friable, sticky and plastic; common fine and medium roots and few coarse roots; many very fine and fine tubular pores; neutral (pH 7.2); clear wavy boundary.

Bt-10 to 26 inches; yellowish brown (10YR 5/4) silty clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and medium roots and few coarse roots; common very fine and fine tubular pores; common thin clay films on faces of peds and lining pores; neutral (pH 7.2); gradual wavy boundary.

Btk-26 to 41 inches; yellowish brown (10YR 5/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and medium roots; common very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; about 5 percent pebbles; strongly effervescent (about 20 percent lime); mildly alkaline (pH 7.6); abrupt broken boundary.

Bqk-41 to 43 inches; very pale brown (10YR 7/4) silt loam, light yellowish brown (10YR 6/4) moist; weak fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine roots matted on duripan fragments; few fine tubular pores; about 10 percent gravel-sized duripan fragments; strongly effervescent (about 20 percent lime); mildly alkaline (pH 7.8); abrupt smooth boundary.

Bqkm-43 to 48 inches; white (10YR 8/2), indurated duripan; massive; common fine roots matted on top of laminar cap; violently effervescent (about 35 percent lime); strongly alkaline (pH 8.5); abrupt wavy boundary.

2R-48 inches; fractured rhyolite; Bqkm horizon material in fractures.

Typical Pedon Location

Map unit in which located: Gooding-Gooding, erodedHamrub complex, 2 to 12 percent slopes

Location in survey area: About 8 miles south and 5 miles west of Gannett; about 2,000 feet east and 850 feet south of the northwest corner of sec. 13, T. 2 S., R. 18 E.

Range in Characteristics

Average annual soil temperature: 47 to 52 degrees F

Depth to bedrock: 45 to 60 inches

Depth to duripan: 40 to 50 inches

Thickness of mollic epipedon: 10 to 13 inches

Depth to secondary lime: 24 to 31 inches

A horizon:
- Value-4 or 5 dry, 2 or 3 moist
- Chroma-2 or 3 dry or moist
- Content of clay-16 to 20 percent

BA horizon:
- Value-4 or 5 dry, *2* or 3 moist
- Chroma-2 to 4 dry or moist
- Content of clay-16 to 20 percent

Bt horizon:
- Hue-10YR or 7.5YR
- Value-5 or 6 dry, 3 or 4 moist
- Texture-silt loam or silty clay loam
- Content of clay-20 to 32 percent
- Reaction-neutral or mildly alkaline

Btk horizon.
- Value-5 or 6 dry, 3 or 4 moist
- Chroma-3 or 4 dry or moist
- Texture-silt loam or silty clay loam
- Content of rock fragments-0 to 5 percent
- Content of clay-20 to 32 percent
- Content of lime-15 to 25 percent
- Reaction-mildly alkaline or moderately alkaline

Bqk horizon:
- Value-6 or 7 dry. 5 or 6 moist
- Chroma-3 or 4 dry or moist
- Texture--silt loam or loam
- Content of gravel-sized duripan fragments-0 to 10 percent
- Content of clay-16 to 20 percent
- Content of lime-15 to 25 percent
- Reaction-mildly alkaline or moderately alkaline

Bqkm horizon:
- Value-7 or 8 dry, 5 to 7 moist
- Chroma-2 or 3 dry or moist
- Content of pebbles-0 to 5 percent
- Content of cobbles-0 to 5 percent
- Content of lime-25 to 40 percent
- Reaction-moderately alkaline or strongly alkaline

Hapur Series

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Moderately slow

Position on landscape: Flood plains

Parent material: Silty alluvium derived from various kinds of rock

Slope: 0 to 2 percent

Elevation: 4,700 to 5,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-loamy, frigid Typic Calciaquolls

Typical Pedon

Ak1-0 to 3 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; strong medium subangular structure; soft, very friable, slightly sticky and plastic; many very fine, fine, and medium roots; many very fine and fine tubular pores; strongly effervescent (about 20 percent lime); moderately alkaline (pH 8.4); clear wavy boundary.

Ak2-3 to 10 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine, fine, and medium roots; many very fine and fine tubular pores; strongly effervescent (about 20 percent lime); moderately alkaline (pH 8.2); clear wavy boundary.

Bkg-10 to 15 inches; gray (5Y 6/1) silty clay loam, dark gray (5Y 4/1) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine, fine, and medium roots; common very fine and fine tubular pores; slightly effervescent (about 10 percent lime); mildly alkaline (pH 7.8); abrupt wavy boundary.

Cg-15 to 30 inches; light gray (2.5Y 7/1) clay loam, gray (2.5Y 6/1) moist; massive; hard, firm, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; mildly alkaline (pH 7.4); clear wavy boundary.

2Cg1-30 to 44 inches; light gray (2.5Y 7/1) fine sandy loam, gray (2.5Y 6/1) moist; massive; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; few very fine and fine tubular pores; mildly alkaline (pH 7.4); clear wavy boundary.

2Cg2-44 to 51 inches; light gray (2.5Y 7/1) loamy fine sand, gray (2.5Y 6/1) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and fine interstitial pores; mildly alkaline (pH 7.4); gradual wavy boundary.

3Cg-51 to 63 inches; light gray (2.5Y 7/1) very gravelly loamy sand, gray (2.5Y 6/1) moist; single grain; loose; many very fine and fine interstitial pores; about 40 percent pebbles; mildly alkaline (pH 7.4).

Typical Pedon Location

Map unit in which located: Hapur-Picabo silt loams, 0 to 2 percent slopes

Location in survey area: About 2.5 miles south of Gannett; about 2,600 feet south and 50 feet east of the northwest corner of sec. 23, T. 1 S., R. 19 E.

Range in Characteristics

Depth to water table: 6 to 12 inches
Depth to sand and gravel: 40 inches or more
Average annual soil temperature: 42 to 47 degrees F
Effervescence: Slightly effervescent or strongly effervescent in the upper part; slightly effervescent or noneffervescent below a depth of 20 inches
Other characteristics: AB horizon present in some pedons

Ak horizon.
Value-4 or 5 dry, 2 or 3 moist
Chroma-1 or 2 dry or moist
Reaction-mildly alkaline to strongly alkaline

Bkg and Cg horizons:
Hue-5Y, 2.5Y, or 10YR
Value-6 or 7 dry, 4 or 5 moist
Chroma-0 to 2 dry or moist
Texture-silty clay loam, clay loam, or loam
Average content of clay-20 to 35 percent
Content of rock fragments-0 to 15 percent
Reaction-neutral to strongly alkaline

3Cg horizon:
Content of clay-0 to 8 percent
Content of rock fragments-25 to 70 percent

Hutton Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Position on landscape: Flood plains
Parent material: Alluvium derived from various kinds of rock
Slope: 0 to 2 percent
Elevation: 4,700 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 41 to 45 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine, montmorillonitic, frigid Cumulic Haplaquolls

Typical Pedon

A1-0 to 2 inches; dark gray (10YR 4/1) clay loam, black (10YR 2/1) moist; weak thin platy structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine

and fine tubular pores; neutral (pH 6.6); clear smooth boundary.

A2-2 to 4 inches; dark gray (10YR 4/1) clay loam, black (10YR 2/1) moist; strong fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; many fine tubular pores; neutral (pH 6.8); clear smooth boundary.

BA-4 to 13 inches; dark gray (10YR 4/1) clay loam, very dark brown (10YR 2/2) moist; weak fine angular blocky structure; hard, firm, sticky and plastic; common fine roots; many fine tubular pores; neutral (pH 6.8); gradual smooth boundary.

Bg1-13 to 19 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; few fine prominent brown (7.5YR 5/4, moist) mottles; strong medium angular blocky structure; hard, firm, sticky and plastic; common fine roots; common fine tubular pores; neutral (pH 6.9); gradual smooth boundary.

Bg2-19 to 24 inches; gray (10YR 5/1) clay, very dark grayish brown (10YR 3/2) moist; common fine prominent dark brown (7.5YR 4/4, moist) mottles; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine roots; few fine tubular pores; neutral (pH 6.6); clear smooth boundary.

Cg-24 to 62 inches; gray (2.5Y 5/1) clay, dark gray (2.5Y 4/1) moist; massive; very hard, very firm, very sticky and very plastic; neutral (pH 6.6).

Typical Pedon Location

Map unit in which located: Hutton clay loam, 0 to 2 percent slopes

Location in survey area: About 6 miles northwest of Carey; about 1,060 feet north and 80 feet west of the southeast corner of sec. 7, T. 1 S., R. 21 E.

Range in Characteristics

Thickness of mollic epipedon: 24 to 30 inches

Depth to water table: 12 to 30 inches

Content of clay in control section: 35 to 55 percent

Content of rock fragments in control section: 0 to 15 percent

Average annual soil temperature: 42 to 47 degrees F

Average summer soil temperature: 60 to 65 degrees F

Other characteristics: BA horizon absent in some pedons

A horizon:

Value-4 or 5 dry, 1 to 3 moist

Chroma-1 or 2 dry or moist

Bg horizon:

Hue-10YR or 2.5Y

Value-4 or 5 dry, 2 or 3 moist

Texture in lower part-silty clay, clay, or gravelly clay

Content of clay-28 to 40 percent in the upper part, 40 to 60 percent in the lower part

Cg horizon:

Value-4 to 7 dry

Content of clay-40 to 60 percent

Hutton Variant

Depth class: Very deep

Drainage class: Well drained

Permeability: Very slow in the upper 39 inches; very rapid below this depth

Position on landscape: Stream terraces

Parent material: Alluvium derived from various kinds of rock

Slope. 0 to 2 percent

Elevation: 4,950 to 6,000 feet

Average annual precipitation: 14 to 18 inches

Average annual air temperature: 39 to 42 degrees F

Frost-free period: Less than 60 days

Taxonomic class: Fine, montmorillonitic, frigid Pachic Ultic Argixerolls

Typical Pedon

A-0 to 3 inches; very dark gray (10YR 3/1) clay loam, black (10YR 2/1) moist; weak medium and thick platy structure parting to moderate fine and medium subangular blocky; hard, very friable, sticky and plastic; many very fine and fine roots and common medium roots; many very fine and fine interstitial pores; about 5 percent pebbles; strongly acid (pH 5.4); abrupt smooth boundary.

ABt-3 to 8 inches; very dark gray (10YR 3/1) clay loam, black (10YR 2/1) moist; weak medium and coarse prismatic structure parting to strong fine and medium subangular blocky; common medium roots; few very fine and fine tubular pores; few thin clay films lining pores and on faces of peds; about 10 percent pebbles; moderately acid (pH 5.8); clear smooth boundary.

Bt1-8 to 13 inches; dark gray (10YR 4/1) clay, black (10YR 2/1) moist; strong medium and coarse subangular blocky structure; very hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine and fine tubular pores; few thin clay films lining pores and on faces of peds; about 10 percent pebbles; moderately acid (pH 5.9); clear wavy boundary.

Bt2-13 to 17 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong medium, coarse, and very coarse prismatic structure; very hard, firm, very sticky and very plastic; few very fine and fine roots concentrated along faces of peds; few very fine tubular pores; common thin clay films lining pores and on faces of peds; about 10 percent pebbles; moderately acid (pH 6.0); gradual wavy boundary.

Bt3-17 to 24 inches; grayish brown (10YR 5/2) gravelly clay, very dark grayish brown (10YR 3/2) moist; strong coarse and very coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots concentrated along faces of peds; few *very* fine tubular pores; common thin clay films lining pores and on faces of peds; about 15 percent pebbles; slightly acid (pH 6.3); gradual wavy boundary.

2Bt4-24 to 31 inches; grayish brown (10YR 5/2) very gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; many very fine and fine interstitial pores and few very fine and fine tubular pores; few thin clay films lining pores and on faces of peds; about 5 percent cobbles and 35 percent pebbles; slightly acid (pH 6.3); clear wavy boundary.

2Bt5-31 to 39 inches; grayish brown (10YR 5/2) very gravelly sandy clay loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine interstitial pores; few clay bridges between sand grains; about 10 percent cobbles and 40 percent pebbles; slightly acid (pH 6.2); gradual wavy boundary.

2B-39 to 52 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and fine interstitial pores; about 10 percent cobbles and 60 percent pebbles; slightly acid (pH 6.3); gradual wavy boundary.

2Bq-52 to 66 inches; multicolored extremely gravelly coarse sand; single grain; loose; few very fine and fine roots; many very fine and fine interstitial pores; about 20 percent cobbles and 60 percent pebbles; silica coatings less than 1 millimeter thick on undersides of some cobbles; slightly acid (pH 6.2).

Typical Pedon Location

Map unit in which located: Hutton Variant clay loam, 0 to 2 percent slopes

Location in survey area: About 1/2 mile southeast of Hailey; about 3,400 feet east and 1,900 feet south of the northwest corner of sec. 15, T. 2 N., R. 18 E.

Range in Characteristics

Average annual soil temperature: 41 to 44 degrees F
Depth to loose sand and gravel: 31 to 40 inches
Thickness of mollic epipedon: 20 to 31 inches
Other characteristics: Bkq horizon present in some pedons

A horizon:
- Value-3 to 5 dry, 2 or 3 moist
- Chroma-1 to 3 dry or moist

Bt horizon:
- Value-4 or 5 dry
- Chroma-1 to 4 dry or moist
- Texture-clay or gravelly clay
- Content of pebbles-5 to 15 percent
- Content of clay-40 to 55 percent

2Bt horizon:
- Hue-2.5Y or 10YR
- Value-3 or 4 moist
- Chroma-2 to 4 dry or moist
- Texture-very gravelly sandy clay loam or very gravelly sandy clay

2B and 2Bq horizons:
- Texture-extremely gravelly sandy loam, extremely gravelly loamy coarse sand, or extremely gravelly coarse sand
- Content of pebbles-55 to 65 percent
- Content of cobbles-5 to 20 percent

Isknat Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow in the upper 35 inches; rapid or very rapid below this depth
Position on landscape: Stream terraces
Parent material: Alluvium derived from various kinds of rock
Slope: 0 to 2 percent
Elevation: 4,950 to 6,100 feet
Average annual precipitation: 14 to 18 inches
Average annual air temperature: 39 to 42 degrees F
Frost-free period: Less than 60 days

Taxonomic class: Clayey-skeletal, montmorillonitic, frigid Pachic Ultic Argixerolls

Typical Pedon

A-0 to 2 inches; very dark gray (10YR 3/1) gravelly clay loam, black (10YR 2/1) moist; weak thin platy structure parting to moderate very fine and fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots and common fine, medium, and coarse roots; many very fine and fine interstitial pores and few very fine tubular pores; about 20 percent pebbles; moderately acid (pH 5.8); abrupt wavy boundary.

Bt1-2 to 7 inches; very dark gray (10YR 3/1) gravelly clay loam, black (10YR 2/1) moist; moderate very fine and fine subangular blocky structure; hard, friable, sticky and plastic; many very fine roots and few fine, medium, and coarse roots; common very fine and fine interstitial pores and few very fine tubular pores; few thin clay films lining pores and on faces of peds; about 15 percent pebbles; moderately acid (pH 5.6); clear wavy boundary.

Bt2-7 to 11 inches; very dark grayish brown (10YR 3/2) gravelly clay loam, black (10YR 2/1) moist; moderate very fine and fine subangular blocky structure; hard, friable, sticky and plastic; common very fine roots and few fine and medium roots; common very fine and fine tubular and interstitial pores; few thin clay films lining pores and on faces of peds; about 25 percent pebbles; moderately acid (pH 5.6); clear wavy boundary.

Bt3-11 to 17 inches; dark grayish brown (10YR 4/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine subangular blocky structure; hard, friable, sticky and plastic; common very fine roots and few fine and medium roots; common very fine and fine tubular and interstitial pores; common thin clay films lining pores and on faces of peds; about 5 percent cobbles and 40 percent pebbles; moderately acid (pH 5.7); gradual wavy boundary,

Bt4-17 to 26 inches; dark grayish brown (10YR 4/2) very gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak very fine and fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; few very fine and fine interstitial pores; common thin clay films lining pores and on faces of peds; about 10 percent cobbles and 45 percent pebbles; moderately acid (pH 5.8); gradual wavy boundary.

Bt5-26 to 35 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and common fine interstitial pores; few clay bridges between sand grains; moderately acid (pH 5.8); clear wavy boundary.

2Bq-35 to 42 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine and fine interstitial pores; about 20 percent cobbles and 50 percent pebbles; silica coatings less than 1 millimeter thick on underside of coarse fragments; moderately acid (pH 6.0); gradual wavy boundary.

2Bkq-42 to 61 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose; few very fine roots; common very fine and fine and few medium interstitial pores; about 1 percent stones, 25 percent cobbles, and 50 percent pebbles; lime and silica coatings less than 1 millimeter thick on underside of coarse fragments; moderately acid (pH 6.0).

Typical Pedon Location

Map unit in which located: Isknat gravelly clay loam, 0 to 2 percent slopes

Location in survey area: About 1/2 mile southeast of Hailey; about 2,700 feet east and 1,700 feet south of the northwest corner of sec. 15, T. 2 N., R. 18 E.

Range in Characteristics

Average annual soil temperature: 41 to 46 degrees F
Depth to loose sand and gravel: 26 to 35 inches
Thickness of mollic epipedon: 20 to 28 inches

A horizon:
- Value-3 or 4 dry
- Chroma-1 or 2 dry or moist

Bt horizon:
- Value-3 to 5 dry, 2 to 4 moist
- Chroma-1 to 4 dry, 1 to 3 moist
- Texture-gravelly clay loam, very gravelly clay loam, very gravelly sandy clay loam, very gravelly sandy clay, or very gravelly clay
- Content of pebbles-10 to 50 percent
- Content of cobbles-0 to 20 percent
- Content of clay-35 to 45 percent

2Bq and 2Bkq horizons:
- Hue and chroma-widely varied because of stratification
- Texture-extremely gravelly sandy loam, extremely

gravelly loamy sand, or extremely cobbly coarse sand
Content of pebbles-40 to 65 percent
Content of stones-0 to 5 percent
Content of cobbles-15 to 30 percent

Justesen Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Fan terraces, basalt plains
Parent material: Alluvium derived from various kinds of rock
Slope: 2 to 30 percent
Elevation: 4,700 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 45 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-loamy, mixed, frigid Calcic Argixerolls

Typical Pedon

A1-0 to 2 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots and few coarse roots; many very fine and fine tubular pores; neutral (pH 7.0); clear smooth boundary.

A2-2 to 5 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; moderate medium and thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots and few coarse roots; many very fine and fine tubular pores; neutral (pH 7.0); clear wavy boundary.

BA-5 to 7 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and plastic: common very fine, fine, and medium roots; many very fine and fine tubular pores; neutral (pH 7.2); clear wavy boundary.

Bt1-7 to 15 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate fine and medium prismatic structure; hard, firm, sticky and plastic; common very fine, fine, and medium roots; common very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; about 5 percent pebbles; neutral (pH 7.2); gradual wavy boundary.

Bt2-15 to 20 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; about 5 percent pebbles; neutral (pH 7.2); gradual wavy boundary.

BC-20 to 24 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; about 5 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary.

Bk1-24 to 30 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; weak medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; about 5 percent pebbles; violently effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk2-30 to 42 inches; light gray (10YR 7/2) loam, light brownish gray (10YR 6/2) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; about 10 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk3-42 to 62 inches; white (10YR 8/2) fine sandy loam, light brownish gray (10YR 6/2) moist; massive; slightly hard, very friable, slightly sticky; few fine tubular pores; about 10 percent pebbles; violently effervescent; moderately alkaline (pH 8.2).

Typical Pedon Location

Map unit in which located: Justesen loam, 4 to 8 percent slopes (fig. 11)
Location in survey area: About 3 miles south and 1/2 mile west of Carey; about 700 feet north and 50 feet west of the southeast corner of sec. 4, T. 2 S., R. 21 E.

Range in Characteristics

Average annual soil temperature: 42 to 47 degrees F
Thickness of mollic epipedon: 11 to 15 inches
Depth to secondary lime: 24 to 44 inches

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 to 4 dry, 2 or 3 moist

Bt horizon:
Value-5 or 6 dry
Chroma-2 or 3 dry or moist

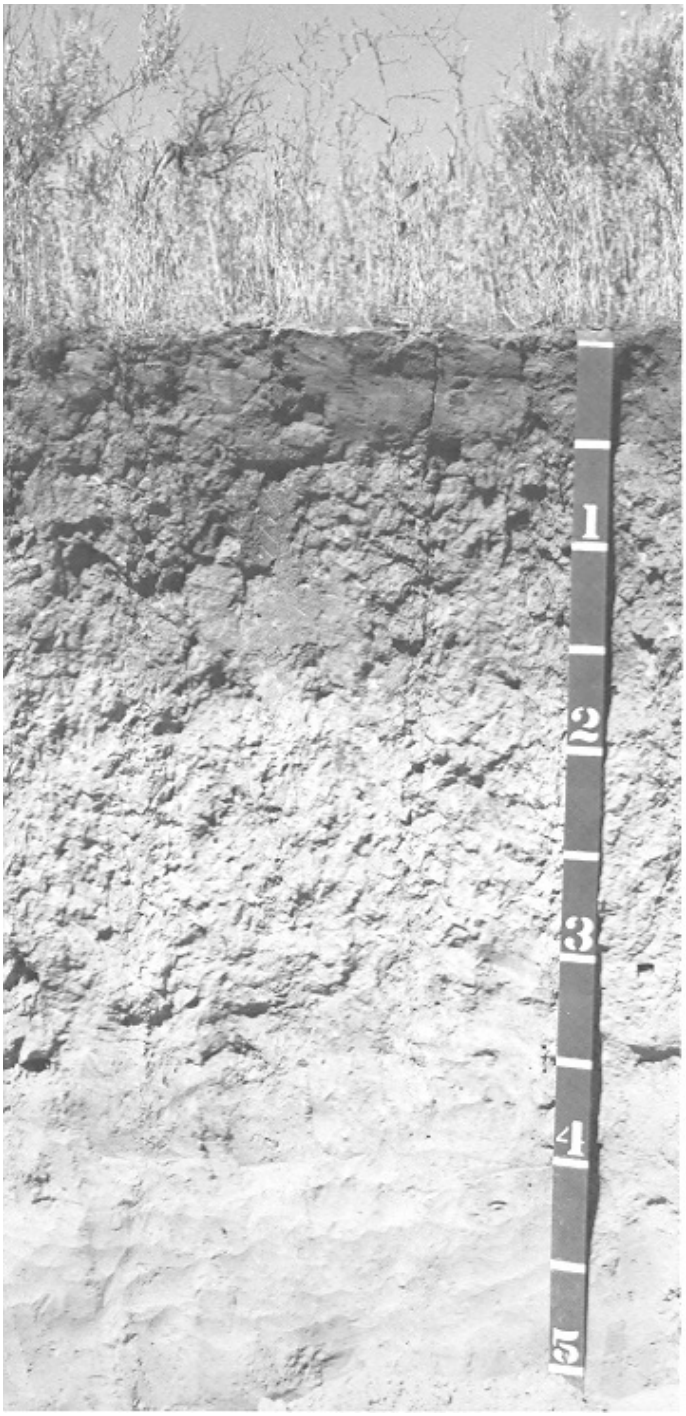

Figure 11.-Profile of Justesen loam, 4 to 8 percent slopes.

Texture-loam, clay loam, or silty clay loam
Content of pebbles-0 to 5 percent
Content of clay-23 to 34 percent
Reaction-neutral or mildly alkaline

Bk and BC horizons:

Texture-fine sandy loam or loam
Content of pebbles-0 to 15 percent

Ketchum Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Position on landscape: Mountainsides
Parent material: Colluvium derived from quartzitic sandstone and related rock
Slope: 30 to 60 percent
Elevation: 6,000 to 8,500 feet
Average annual precipitation: 18 to 24 inches
Average annual air temperature: 36 to 39 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Loamy-skeletal, mixed Typic Cryochrepts

Typical Pedon

O11-2 inches to 1 inch; undecomposed forest litter.
O12-1 inch to 0; decomposed forest litter.
A1-0 to 3 inches; brown (10YR 5/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 40 percent pebbles and 5 percent cobbles; neutral (pH 6.8); abrupt wavy boundary.
A2-3 to 11 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, dark brown (10YR 4/3) moist; weak fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 35 percent pebbles and 10 percent cobbles; neutral (pH 6.8); abrupt wavy boundary.
Bw1-11 to 32 inches; light gray (10YR 7/2) very gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable; common very fine, fine, medium, and coarse roots; common very fine tubular pores; about 45 percent pebbles and 10 percent cobbles; neutral (pH 7.0); gradual wavy boundary.
Bw2-32 to 42 inches: very pale brown (10YR 7/3) very gravelly sandy loam, brown (10YR 5/3) moist; weak

fine subangular blocky structure; soft, very friable; common very fine, fine, medium, and coarse roots; many very fine and fine tubular pores; about 40 percent pebbles and 10 percent cobbles; neutral (pH 7.0); clear wavy boundary.

BC-42 to 48 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable; common very fine, fine, medium, and coarse roots; many very fine and fine tubular pores; about 50 percent pebbles and 5 percent cobbles; neutral (pH 7.0); clear smooth boundary.

C-48 to 61 inches; light gray (10YR 7/2) extremely gravelly coarse sandy loam, brown (10YR 5/3) moist; single grain; friable; many very fine, fine, medium, and coarse roots; about 75 percent pebbles and 10 percent cobbles; neutral (pH 7.0).

Typical Pedon Location

Map unit in which located: Ketchum-Povey complex, 30 to 60 percent slopes

Location in survey area: About 4 miles east and 3 miles north of Hailey; about 1,400 feet south and 100 feet west of the northeast corner of sec. 19, T. 3 N., R. 19 E.

Range in Characteristics

Depth to bedrock: More than 60 inches

Average annual soil temperature: 38 to 42 degrees F

Average summer soil temperature: 54 to 59 degrees F

Content of clay in textural control section: 10 to 20 percent

Base saturation to a depth of 75 centimeters: 60 to 75 percent

Other characteristics: Bw2 and 0 horizons absent in some pedons

A1 horizon:

Value-4 or 5 dry, 2 or 3 moist

Content of rock fragments-35 to 60 percent

A2 and Bw1 horizons:

Value-6 or 7 dry, 4 or 5 moist

Texture-very gravelly loam, very gravelly sandy loam, or very gravelly fine sandy loam

Content of rock fragments-35 to 60 percent

Bw2 horizon:

Hue-2.5Y or 10YR

Texture-very gravelly loam or very gravelly sandy loam

Content of rock fragments-35 to 60 percent

BC horizon:

Hue-2.5Y or 10YR

Texture-very gravelly sandy loam, very gravelly fine sandy loam, or very gravelly loam

Content of rock fragments-35 to 60 percent

C horizon:

Value-6 or 7 dry, 4 or 5 moist

Texture-extremely gravelly fine sandy loam, or extremely gravelly coarse sandy loam

Content of rock fragments-60 to 80 percent

Reaction-neutral or mildly alkaline

Laurentzen Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately slow

Position on landscape: Foothills

Parent material: Alluvium derived from basalt

Slope: 4 to 30 percent

Elevation: 5,000 to 6,000 feet

Average annual precipitation: 12 to 16 inches

Average annual air temperature: 40 to 43 degrees F

Frost-free period: 60 to 90 days

Taxonomic class: Fine-silty, mixed, frigid Pachic Ultic Argixerolls

Typical Pedon

A1-0 to 6 inches; dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many fine and very fine interstitial pores; neutral (pH 6.6); clear wavy boundary.

A2-6 to 13 inches; dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; few very fine tubular pores; neutral (pH 6.8); clear smooth boundary.

Bt1-13 to 26 inches; brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common fine and very fine roots; common very fine and fine tubular pores; neutral (pH 7.0); gradual wavy boundary.

Bt2-26 to 40 inches; yellowish brown (10YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; strong fine and medium subangular blocky structure; very hard,

very firm, sticky and plastic; few very fine and fine roots; common very fine, fine, and medium tubular pores; common moderately thick clay films on faces of peds; about 5 to 10 percent pebbles; neutral (pH 7.0); gradual wavy boundary.

Bt3-40 to 63 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 3/4) moist; strong medium and coarse subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; few fine and medium tubular pores; common moderately thick clay films on faces of peds; about 5 to 10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary.

2R-63 inches; basalt.

Typical Pedon Location

Map unit in which located: Laurentzen-Mulshoe complex, 4 to 30 percent slopes

Location in survey area: About 6 miles south and 9 miles west of Bellevue; about 2,300 feet west and 1,500 feet south of the northeast corner of sec. 32, T. 1 N., R. 17 E.

Range in Characteristics

Depth to bedrock: 60 to 72 inches
Thickness of mollic epipedon: 20 to 35 inches
Base saturation: 50 to 75 percent
Average annual soil temperature: 42 to 46 degrees F
Average summer soil temperature: 61 to 65 degrees F
Reaction: Slightly acid or neutral

A horizon:
Hue-10YR or 7.5YR
Value-4 or 5 dry, 2 or 3 moist
Texture-loam or silt loam

Bt horizon:
Hue-10YR to 5YR
Chroma-2 to 4 dry or moist
Texture-clay loam, loam, or silty clay loam
Content of clay-22 to 35 percent
Content of sand coarser than very fine sand-less than 15 percent

Lavacreek Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Mountainsides
Parent material: Mantle of volcanic tephra over colluvium derived from quartzitic sandstone and related rock
Slope: 15 to 60 percent
Elevation: 5,300 to 9,250 feet
Average annual precipitation: 18 to 22 inches
Average annual air temperature: 37 to 41 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Loamy-skeletal, mixed Andeptic Cryoborolls

Typical Pedon

A1-0 to 4 inches; dark brown (10YR 3/3) very gravelly silt loam, very dark brown (10YR 3/2) moist; weak fine granular structure: soft, very friable; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 35 percent pebbles; neutral (pH 6.6); clear wavy boundary.

A2-4 to 23 inches; brown (10YR 4/3) very gravelly silt loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 40 percent pebbles; neutral (pH 6.6); gradual wavy boundary.

BA-23 to 36 inches; dark yellowish brown (10YR 4/4) very cobbly loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; soft, very friable; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 30 percent cobbles and 25 percent pebbles; neutral (pH 6.8); gradual wavy boundary.

Bw-36 to 41 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine tubular pores; about 35 percent cobbles and 30 percent pebbles; few discontinuous bleached sand and silt grains on faces of peds; neutral (pH 6.8); clear wavy boundary.

2C-41 to 49 inches; very pale brown (10YR 7/3) extremely cobbly sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable; few very fine roots; many very fine tubular pores; about 40 percent cobbles and 30 percent pebbles; neutral (pH 6.8); diffuse irregular boundary.

2R-49 inches; fractured quartzite; less than 5 percent C horizon material in fractures.

Typical Pedon Location

Map unit in which located: Lavacreek-Dollarhide very gravelly silt loams, cold, 15 to 60 percent slopes

Location in survey area: About 4 miles north and 1 mile

east of Lavalake Ranch; about 2,500 feet north and 800 feet east of the southwest corner of sec. 2, T. 1 N., R. 23 E.

Range in Characteristics

Depth to bedrock: 40 to 60 inches
Thickness of mollic epipedon: 10 to 23 inches
Bulk density (1/3 bar water tension) in upper 75 centimeters: 0.95 gram per centimeter or less
Average annual soil temperature: 37 to 43 degrees F
Average summer soil temperature: 54 to 59 degrees F
Reaction: Moderately acid to neutral
Other characteristics: C horizon absent in some pedons

A horizon:
Value-3 to 5 dry
Content of rock fragments-35 to 50 percent

Bw horizon:
Hue-10YR or 7.5YR
Value-4 to 6 dry, 3 or 4 moist
Chroma-3 or 4 dry or moist
Texture-very gravelly silt loam, very cobbly loam, or extremely cobbly loam
Content of rock fragments-35 to 65 percent
Content of clay-10 to 20 percent

2C horizon:
Value-6 or 7 dry
Texture-very gravelly loam, extremely gravelly loam, or extremely cobbly sandy loam
Content of rock fragments-35 to 70 percent
Content of clay-10 to 20 percent

Little Wood Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper 26 inches; rapid or very rapid below this depth
Position on landscape: Stream terraces
Parent material: Alluvium derived from various kinds of rock
Slope: 0 to 4 percent
Elevation: 4,700 to 6,200 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 41 to 45 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal, mixed, frigid Ultic Argixerolls

Typical Pedon

Ap-0 to 8 inches; brown (10YR 4/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly plastic; common very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 15 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

A-8 to 13 inches; brown (10YR 4/3) gravelly loam, *very* dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly plastic; common very fine, fine, medium, and coarse roots; common very fine tubular pores; about 25 percent pebbles; slightly acid (pH 6.5); abrupt smooth boundary.

Bt1-13 to 18 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine, fine, and medium roots; many very fine tubular pores; about 35 percent pebbles and 10 percent cobbles; few thin clay films on faces of peds; neutral (pH 6.8); clear wavy boundary.

Bt2-18 to 26 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine, fine, and medium roots; many very fine tubular pores; about 45 percent pebbles and 10 percent cobbles; common moderately thick clay films on faces of peds; neutral (pH 6.8); clear wavy boundary.

BC-26 to 32 inches; yellowish brown (10YR 5/4) extremely gravelly coarse sandy loam, dark yellowish brown (1OYR 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few *very* fine, fine, and medium roots; many very fine interstitial pores; about 50 percent pebbles and 10 percent cobbles; few thin clay films bridging sand grains; neutral (pH 7.0); abrupt smooth boundary.

C1-32 to 42 inches; brown (10YR 5/3) extremely gravelly loamy coarse sand, dark brown (10YR 4/3) moist; single grain; loose, very friable; few very fine, fine, and medium roots; many *very* fine interstitial pores; about 50 percent pebbles and 15 percent cobbles; neutral (pH 7.0); gradual wavy boundary.

C2-42 to 61 inches; pale brown (10YR 6/3) extremely gravelly coarse sand, brown (10YR 5/3) moist; single grain; loose, very friable; about 60 percent pebbles and 15 percent cobbles; neutral (pH 7.2).

Typical Pedon Location

Map unit in which located: Little Wood gravelly loam, 0 to 2 percent slopes

Location in survey area: About 2 miles north and 2.5 miles west of Carey; about 1,800 feet east and 2,000 feet north of the southwest corner of sec. 8, T. 1 S., R. 21 E.

Range in Characteristics

Thickness of mollic epipedon: 11 to 19 inches
Average annual soil temperature: 42 to 47 degrees F
Average summer soil temperature: 60 to 65 degrees F
Reaction: Slightly acid or neutral
Base saturation: 50 to 75 percent

A horizon:
Value-3 to 5 dry, 2 or 3 moist
Chroma-1 to 3 dry or moist
Texture-gravelly loam or very gravelly loam
Content of rock fragments-15 to 60 percent

Bt horizon:
Hue-10YR or 7.5YR
Value-4 to 6 dry, 3 or 4 moist
Chroma-2 to 4 dry or moist
Texture-very gravelly sandy clay loam, very gravelly clay loam, or extremely cobbly sandy clay loam
Content of rock fragments-35 to 70 percent
Content of clay-20 to 35 percent

BC horizon:
Chroma-3 or 4 moist
Texture-extremely gravelly coarse sandy loam, extremely cobbly sandy loam, or extremely gravelly loamy coarse sand
Content of rock fragments-35 to 70 percent

C horizon:
Texture-extremely gravelly loamy coarse sand, extremely gravelly coarse sand, extremely cobbly loamy coarse sand, or extremely cobbly coarse sand
Content of rock fragments-60 to 80 percent
Other characteristics-weak accumulations of lime and silica on underside of coarse fragments in some pedons

Lockman Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderately rapid
Position on landscape: Mountainsides
Parent material: Residuum and colluvium derived from granite
Slope: 30 to 60 percent
Elevation: 6,000 to 8,200 feet
Average annual precipitation: 18 to 22 inches
Average annual air temperature: 37 to 41 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Coarse-loamy, mixed Typic Cryoborolls

Typical Pedon

A1-0 to 10 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; about 10 percent pebbles; neutral (pH 7.0); gradual wavy boundary.

A2-10 to 15 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; about 10 percent pebbles; neutral (pH 7.2); clear wavy boundary.

Bw-15 to 23 inches; pale brown (10YR 6/3) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium granular structure; slightly hard, friable; common very fine and fine roots; many very fine and fine interstitial pores; about 20 percent pebbles and 5 percent cobbles; neutral (pH 7.2); gradual wavy boundary.

C-23 to 44 inches; pale brown (10YR 6/3) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; moderate fine and medium granular structure; slightly hard, friable; common very fine and fine roots; many very fine and fine interstitial pores; about 25 percent pebbles and 5 percent cobbles; neutral (pH 6.6); gradual wavy boundary.

Cr-44 to 58 inches; light yellowish brown (10YR 6/4) gruss and weathered granite.

R-58 inches; granite.

Typical Pedon Location

Map unit in which located: Earcree-Lockman complex, 30 to 60 percent slopes
Location in survey area: About 3 miles south and 9 miles west of Hailey; about 1,400 feet west and 1,600 feet south of the northeast corner of sec. 25, T. 2 N., R. 16 E.

Range in Characteristics

Depth to bedrock: 40 to 60 inches
Average annual soil temperature: 38 to 43 degrees F
Content of clay in textural control section: 5 to 15 percent

Average summer soil temperature: 44 to 47 degrees F
Base saturation: 50 to 75 percent
Reaction: Moderately acid to neutral

A horizon:
Value-3 to 5 dry, 2 or 3 moist
Chroma-1 to 3 dry or moist

Bw horizon:
Value-5 to 7 dry, 4 or 5 moist
Chroma-2 to 4 dry or moist
Texture-sandy loam or gravelly sandy loam

C horizon:
Hue-10YR to 5Y
Value-6 to 8 dry, 4 to 6 moist
Chroma-3 to 6 dry or moist
Texture-gravelly sandy loam or gravelly loamy sand

Manard Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Position on landscape: Basalt plains
Parent material: Residuum derived from basalt
Slope: 1 to 8 percent
Elevation: 4,700 to 6,200 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine, montmorillonitic, frigid Typic Durixerolls

Typical Pedon

A-0 to 6 inches; dark grayish brown (10YR 4/2) very stony silt loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine tubular pores; about 15 percent stones and 5 percent cobbles; neutral (pH 7.0); clear wavy boundary.

BA-6 to 11 inches; dark brown (10YR 4/3) very stony silt loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; common very fine and fine tubular pores; about 15 percent stones, 10 percent cobbles, and 5 percent pebbles; neutral (pH 7.0); abrupt smooth boundary.

Bt-1 1 to 20 inches; brown (10YR 5/3) silty clay, dark yellowish brown (10YR 4/4) moist; moderate fine and medium prismatic structure; hard, firm, sticky and plastic; few very fine and fine roots on horizontal and vertical faces of peds; few very fine and fine tubular pores; about 5 percent stones and 5 percent cobbles; common thick clay films on faces of peds; neutral (pH 7.2); gradual smooth boundary.

Btk-20 to 26 inches; brown (10YR 5/3) clay, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots on horizontal and vertical faces of peds; few very fine and fine tubular pores; about 5 percent stones and 5 percent cobbles; few moderately thick clay films on faces of peds; slightly effervescent (about 10 percent lime); mildly alkaline (pH 7.4); abrupt wavy boundary.

Bqkm-26 to 28 inches; very pale brown (10YR 7/3), indurated duripan, pale brown (10YR 6/3) moist; abrupt smooth boundary.

R-28 inches; lime-coated basalt.

Typical Pedon Location

Map unit in which located: Goodington-Manard complex, 2 to 8 percent slopes
Location in survey area: About 12 miles east and 5 miles north of Carey; about 2,500 feet east and 200 feet north of the southwest corner of sec. 33, T. 1 N., R. 23 E.

Range in Characteristics

Depth to bedrock: 21 to 38 inches
Depth to duripan: 20 to 37 inches
Thickness of mollic epipedon: 7 to 11 inches
Average annual soil temperature: 42 to 47 degrees F
Average summer soil temperature: 61 to 66 degrees F
Reaction: Slightly acid to mildly alkaline

A horizon:
Hue-10YR or 7.5YR
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Texture-stony silt loam or silt loam
Content of rock fragments-0 to 25 percent

BA horizon:
Value-4 or 5 dry
Texture-stony silt loam or silt loam
Content of rock fragments-0 to 25 percent

Bt horizon:
Hue-10YR to 5YR
Value-5 or 6 dry, 3 or 4 moist
Chroma-3 or 4 dry or moist

Texture-silty clay or clay
Content of rock fragments-0 to 10 percent
Content of clay-40 to 50 percent

Btk horizon:
Value-5 or 6 dry
Chroma-3 or 4 dry
Texture-silty clay or clay
Content of rock fragments-0 to 10 percent
Content of clay-35 to 50 percent

Bqkm horizon:
Value-6 to 8 dry
Chroma-2 or 3 dry

Marshdale Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Position on landscape: Drainageways, flood plains
Parent material: Alluvium derived from various kinds of rock
Slope: 0 to 2 percent
Elevation: 4,800 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-loamy, mixed, frigid Cumulic Haplaquolls

Typical Pedon

A1-0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; mildly alkaline (pH 7.6); clear smooth boundary.

A2-4 to 14 inches; dark grayish brown (10YR 4/2) loam, very dark gray (10YR 3/1) moist; few fine distinct dark yellowish brown (10YR 4/4, dry) mottles; weak fine and medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; about 5 percent pebbles; mildly alkaline (pH 7.6) clear wavy boundary.

A3-14 to 27 inches; dark grayish brown (2.5Y 4/2) loam, very dark grayish brown (2.5Y 3/2) moist; few fine distinct dark yellowish brown (10YR 4/4, dry) mottles; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; about 5 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary.

Cg1-27 to 50 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; about 10 percent pebbles; moderately alkaline (pH 8.0); abrupt wavy boundary.

2Cg2-50 to 65 inches; light gray (2.5Y 6/1) gravelly coarse sand, gray (2.5Y 5/1) moist; single grain; loose; about 25 percent pebbles; mildly alkaline (pH 7.6).

Typical Pedon Location

Map unit in which located: Marshdale-Bruneel loams, 0 to 2 percent slopes
Location in survey area: About 6 miles west and 14 miles north of Carey; about 1,000 feet north and 2,700 feet west of the southeast corner of sec. 15, T. 2 N., R. 20 E.

Range in Characteristics

Thickness of mollic epipedon: 24 to 50 inches
Depth to secondary lime: 40 to more than 60 inches
Depth to water table: 6 to 18 inches
Average annual soil temperature: 42 to 47 degrees F

A1 horizon:
Hue-5Y to 7.5YR
Value-3 to 5 dry, 2 or 3 moist
Chroma-1 to 3 dry or moist
Reaction-neutral or mildly alkaline

A2 and A3 horizons:
Value-4 or 5 dry
Chroma-1 or 2 dry
Texture-loam, sandy clay loam, or clay loam
Content of clay-18 to 30 percent
Content of rock fragments-0 to 10 percent

2Cg horizon:
Value-6 or 7 dry
Chroma-1 to 4 dry
Texture-gravelly coarse sand or very gravelly coarse sand
Content of rock fragments-20 to 45 percent

McBiggam Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow

Position on landscape: Basalt plains
Parent material: Loess over residuum derived from basalt
Slope: 2 to 8 percent
Elevation: 5,300 to 5,600 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-silty, mixed, frigid Typic Palexerolls

Typical Pedon

A1-0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine interstitial pores; about 10 percent gravel-sized cinders; slightly acid (pH 6.4); clear smooth boundary.

A2-3 to 10 inches; dark brown (10YR 3/3) silt loam, very dark brown (10YR 2/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine interstitial pores; about 10 percent gravel-sized cinders; neutral (pH 6.6); clear smooth boundary.

BA-10 to 15 inches; dark brown (10YR 4/3) silt loam, very dark grayish brown (10YR 3/2) moist; strong fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine, fine, and medium tubular pores; neutral (pH 7.0); clear smooth boundary.

Bt-15 to 26 inches; light yellowish brown (10YR 6/4) silty clay loam, dark brown (10YR 4/3) moist; strong fine and medium angular blocky structure; hard, firm, sticky and plastic; common very fine, fine, and medium roots; common very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; few thin bleached sand and silt grains on faces of peds; about 5 percent cobbles and 5 percent pebbles; neutral (pH 7.0); abrupt smooth boundary.

2Btb-26 to 36 inches; brown (7.5YR 4/2) silty clay, dark brown (7.5YR 3/4) moist; strong medium and coarse prismatic structure; very hard, very firm, very sticky and plastic; common very fine and fine roots; few very fine tubular pores; many continuous slickensides on faces of peds; many moderately thick clay films lining pores; mildly alkaline (pH 7.4); abrupt wavy boundary.

2Btkb1-36 to 46 inches; brown (7.5YR 4/4) silty clay, dark brown (7.5YR 3/4) moist; strong medium angular blocky structure; very hard, very firm, very sticky and plastic; few very fine and fine roots; common very fine tubular pores; many continuous slickensides on faces of peds; common moderately thick clay films lining pores; strongly effervescent; mildly alkaline (pH 7.8); clear wavy boundary.

2Btkb2-46 to 80 inches; brown (7.5YR 5/4) silty clay loam, brown (7.5YR 4/4) moist; massive; hard, firm, sticky and plastic; few fine roots; few fine tubular pores; nearly continuous pinkish white (7.5YR 8/2) lime coatings on faces of peds and in pores; strongly effervescent; mildly alkaline (pH 8.2).

Typical Pedon Location

Map unit in which located: McBiggam silt loam, 2 to 8 percent slopes
Location in survey area: About 2 miles north and 18 miles east of Carey; about 2,500 feet east and 400 feet north of the southwest corner of sec. 15, T. 1 S., R. 24 E.

Range in Characteristics

Thickness of mollic epipedon: 11 to 15 inches
Depth to buried B horizon: 22 to 36 inches
Average annual soil temperature: 42 to 45 degrees F
Reaction: Slightly acid to moderately alkaline
Average content of clay in upper 20 inches of argillic horizon: 26 to 35 percent

A horizon:
Value-3 to 5 dry, 2 or 3 moist

Bt horizon:
Value-4 to 6 dry
Texture-silt loam or silty clay loam
Content of rock fragments-5 to 10 percent
Content of clay-22 to 32 percent

2Btb and 2Btkb1 horizons:
Value-3 to 5 dry, 3 or 4 moist
Content of clay-40 to 50 percent
Reaction-neutral or mildly alkaline

2Btkb2 horizon:
Value-5 to 8 dry, 4 or 5 moist
Chroma-2 to 4 dry or moist
Texture-silty clay loam or clay loam
Content of rock fragments-0 to 5 percent
Content of clay-30 to 40 percent
Reaction-mildly alkaline or moderately alkaline

McCarey Series

Depth class: Moderately deep

Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Buttes, basalt plains
Parent material: Loess over residuum derived from basalt
Slope: 2 to 30 percent
Elevation: 4,700 to 5,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 41 to 45 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-loamy, mixed, frigid Calcic Argixerolls

Typical Pedon

A1-0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; neutral (pH 6.8); clear wavy boundary.
A2-4 to 10 inches; dark brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; neutral (pH 7.0); clear wavy boundary.
Bt-10 to 22 inches; yellowish brown (10YR 5/4) clay loam, brown (10YR 4/3) moist; strong medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; neutral (pH 7.2); clear smooth boundary.
Bk1-22 to 25 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; moderate fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; about 5 percent pebbles; violently effervescent (about 20 percent lime); moderately alkaline (pH 8.2); clear smooth boundary.
Bk2-25 to 37 inches; white (10YR 8/2) silt loam, very pale brown (10YR 7/3) moist; massive; few very fine and fine roots; few fine and very fine tubular pores; about 10 percent pebbles; violently effervescent (about 20 percent lime); abrupt smooth boundary.
R-37 inches; basalt.

Typical Pedon Location

Map unit in which located: McCarey-Molyneux loams, 2 to 8 percent slopes
Location in survey area: About 12 miles east of Carey; about 500 feet east and 50 feet north of the southwest corner of sec. 34, T. 1 S., R. 24 E.

Range in Characteristics

Depth to bedrock: 20 to 40 inches
Depth to secondary lime: 15 to 25 inches
Average annual soil temperature: 42 to 47 degrees F
Content of clay in control section: 20 to 34 percent

A horizon:
Value-4 or 5 dry
Reaction-slightly acid to mildly alkaline

Bt horizon:
Hue-5YR to 10YR
Value-5 or 6 dry, 3 to 5 moist
Chroma-2 to 4 dry or moist
Texture-silt loam, clay loam, or silty clay loam
Content of rock fragments-0 to 10 percent
Reaction-neutral to moderately alkaline

Bk horizon:
Value-5 to 7 moist Texture-silt loam or loam
Effervescence-strongly effervescent or violently effervescent
Reaction-neutral to moderately alkaline

Milligan Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid to a depth of 18 inches; very rapid below this depth
Position on landscape: Mountainsides
Parent material: Colluvium derived from quartzitic sandstone and related rock
Slope: 30 to 75 percent
Elevation: 5,200 to 8,500 feet
Average annual precipitation: 12 to 18 inches
Average annual air temperature: 40 *to* 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal over fragmental, mixed, frigid Typic Haploxerolls

Typical Pedon

A-0 to 8 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 20 percent pebbles and 40 percent cobbles; slightly acid (pH 6.4); gradual wavy boundary.

Bw-8 to 18 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, very friable; common very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 45 percent cobbles and 20 percent pebbles; neutral (pH 6.8); abrupt wavy boundary.

C-18 to 24 inches; gray (N 5/0), displaced, fractured quartzite; some voids and some brown (10YR 5/3) loam between rock fragments; few fine and medium roots; 85 percent rock fragments; abrupt wavy boundary.

2R-24 inches; hard quartzite.

Typical Pedon Location

Map unit in which located: Rubbleland-Milligan complex, 60 to 75 percent slopes

Location in survey area: About 5 miles east and 2 miles south of Bellevue; about 2,000 feet south and 200 feet west of the northeast corner of sec. 1, T. 1 N., R. 19 E.

Range in Characteristics

Depth to bedrock: 20 to 40 inches

Thickness of mollic epipedon: 7 to 15 inches

Average annual soil temperature: 42 to 46 degrees F

Content of clay in textural control section: 8 to 15 percent

A horizon:

Value-4 or 5 dry
Chroma-2 or 3 dry or moist
Content of rock fragments-35 to 60 percent
Reaction-slightly acid or neutral

Bw horizon:

Value-4 to 6 dry, 3 or 4 moist
Chroma-3 or 4 dry or moist
Texture-very gravelly loam, extremely gravelly loam, or extremely cobbly loam
Content of rock fragments-55 to 75 percent
Reaction-neutral or mildly alkaline

Taxadjunct Feature

The Milligan soils in this survey area at elevations above about 7,500 feet have cryic temperatures, which are outside the range for the series. This difference, however, does not significantly affect use and management.

Molyneux Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately slow

Position on landscape: Fan terraces, basalt plains

Parent material: Alluvium derived from various kinds of rock

Slope: 2 to 15 percent

Elevation: 4,800 to 6,000 feet

Average annual precipitation: 12 to 16 inches

Average annual air temperature: 40 to 43 degrees F

Frost-free period: 60 to 90 days

Taxonomic class: Fine-loamy, mixed, frigid Ultic Argixerolls

Typical Pedon

A1-0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate thin and medium platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; common very fine interstitial pores; about 10 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.

A2-8 to 13 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, medium, and coarse roots; many very fine, fine, and medium interstitial pores; about 5 percent pebbles; slightly acid (pH 6.2); abrupt wavy boundary.

Bt1-13 to 24 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium prismatic structure; hard, friable, sticky and plastic; few very fine, fine, medium, and coarse roots; many fine and medium tubular pores; about 10 percent pebbles; slightly acid (pH 6.4); clear *wavy* boundary.

Bt2-24 to 50 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong fine and medium angular blocky structure; very hard, firm, sticky and plastic; few very fine and medium roots; many fine and medium interstitial pores; many thin clay films on faces of peds; about 10 percent pebbles; neutral (pH 6.6); clear wavy boundary.

Bt3-50 to 75 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine, fine, and medium roots; many fine and medium interstitial pores; many thin clay films on faces of peds; about 15 percent gravel; neutral (pH 6.8).

Typical Pedon Location

Map unit in which located: Molyneux loam, cool, 2 to 15 percent slopes
Location in survey area: About 3 miles west and 1 mile north of Hailey; about 1,000 feet south and 1,000 feet west of the northeast corner of sec. 24, T. 2 N., R.17E.

Range in Characteristics

Depth to bedrock: 60 inches or more
Thickness of mollic epipedon: 10 to 20 inches
Average annual soil temperature: 42 to 47 degrees F
Base saturation in upper 75 centimeters: 50 to 75 percent
Reaction: Slightly acid to mildly alkaline

A horizon:
Content of clay-10 to 15 percent
Content of rock fragments-0 to 10 percent

Bt1 and Bt2 horizons:
Value-3 to 5 dry, 2 to 4 moist
Chroma-2 to 4 dry or moist
Content of clay-27 to 35 percent
Content of rock fragments-0 to 15 percent
Texture-clay loam, silt loam, or loam

Bt3 horizon:
Value-3 to 5 moist
Chroma-3 or 4 dry or moist
Texture-gravelly sandy clay loam or gravelly clay loam
Content of rock fragments-15 to 25 percent

Moonstone Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately rapid
Position on landscape: Foothills, mountainsides
Parent material: Colluvium and residuum derived from granite
Slope: 8 to 60 percent
Elevation: 4,800 to 7,800 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Coarse-loamy, mixed, frigid Pachic Ultic Haploxerolls

Typical Pedon

A-0 to 17 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable; many very fine and fine roots; many fine and medium interstitial pores; 20 percent pebbles; neutral (pH 6.8); clear wavy boundary.
AB-17 to 26 inches; brown (10YR 4/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak medium granular structure; slightly hard, friable; common very fine and fine roots; common very fine and fine tubular pores; 25 percent fine pebbles; neutral (pH 6.8); diffuse irregular boundary.
Bw-26 to 34 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine and fine roots; common fine and medium tubular pores; 15 percent fine pebbles; neutral (pH 6.6); abrupt wavy boundary.
Cr-34 inches; very pale brown (10YR 7/3), weathered granite.

Typical Pedon Location

Map unit in which located: Earcree-Moonstone association, 8 to 30 percent slopes
Location in survey area: About 11 miles west and 2 miles south of Bellevue; about 1,250 feet west and 800 feet south of the northeast corner of sec. 13, T. 1 N., R. 16 E.

Range in Characteristics

Depth to bedrock: 20 to 40 inches
Thickness of mollic epipedon: 22 to 32 inches
Average annual soil temperature: 42 to 47 degrees F
Base saturation in upper 75 centimeters: 50 to 75 percent
Content of clay in textural control section: 10 to 15 percent

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry, 1 to 3 moist
Content of rock fragments-15 to 35 percent
Reaction-slightly acid or neutral

Bw horizon:
Value-4 to 6 dry, 3 or 4 moist
Texture-gravelly coarse sandy loam or coarse sandy loam
Content of rock fragments-5 to 35 percent

Muldoon Series

Depth class: Deep
Drainage class: Well drained

Permeability: Moderately slow
Position on landscape: Fan terraces
Parent material: Alluvium derived from various kinds of igneous and metamorphic rock
Slope: 2 to 15 percent
Elevation: 4,800 to 6,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-loamy, mixed, frigid Ultic Argixerolls

Typical Pedon

A1-0 to 3 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; slightly acid (pH 6.2); clear smooth boundary.

A2-3 to 7 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable; many very fine and fine roots; many fine tubular pores; few thin clay films on faces of peds; slightly acid (pH 6.4); abrupt smooth boundary.

Bt1-7 to 11 inches; yellowish brown (10YR 5/4) clay loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, sticky and plastic; many very fine, fine, and medium roots; many fine tubular pores; common thin clay films on faces of peds; slightly acid (pH 6.4); clear wavy boundary.

Bt2-11 to 22 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; hard, friable, very sticky and plastic; common fine and medium roots; many fine tubular pores; many moderately thick clay films on faces of peds and lining pores; neutral (pH 6.8); gradual smooth boundary.

Bt3-22 to 32 inches; yellowish brown (10R 5/4) clay loam, dark yellowish brown (10YR 3/4) moist; strong fine angular blocky structure; very hard, firm, very sticky and very plastic; few fine and medium roots; common very fine tubular pores; many thick clay films on faces of peds and lining pores; neutral (pH 6.8); gradual smooth boundary.

Bt4-32 to 45 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, very sticky and very plastic; few fine roots; few very fine tubular pores; about 5 percent pebbles; common moderately thick clay films on faces of peds and lining pores; neutral (pH 7.2); clear smooth boundary.

2Bqm-45 to 56 inches; light yellowish brown (10YR 6/4), indurated duripan, dark yellowish brown (10YR 4/4) moist; massive; few very fine tubular pores; plates cemented with silica (veins of silica about 1 to 4 millimeters thick in plates); neutral (pH 7.2).

Typical Pedon Location

Map unit in which located: Muldoon-Peevywell loams, 2 to 15 percent slopes
Location in survey area: About 11 miles north and 5 miles west of Carey; about 300 feet west and 450 feet south of the northeast corner of sec. 35, T. 2 N., R. 20 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Depth to duripan: 40 *to* 60 inches
Thickness of mollic epipedon: 10 to 16 inches
Base saturation in upper 30 inches: 50 to 75 percent
Average annual soil temperature: 42 to 46 degrees F
Other characteristics: A2, Bt1 , or Bt4 horizons absent in some pedons

A horizon:
Value-4 or 5 dry, 2 or 3 moist

Bt horizon:
Hue-10YR or 7.5YR
Value-2 to 5 moist
Chroma-2 to 4 dry or moist
Texture-clay loam, silty clay loam, or cobbly clay loam
Content of rock fragments-0 to 30 percent
Content of clay-27 to 35 percent

2Bqm horizon:
Distance between plates-2 to 10 centimeters

Mulshoe Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Mountainsides, basalt plains, foothills
Parent material: Residuum and colluvium derived from basalt
Slope: 4 to 60 percent
Elevation: 4,800 to 7,500 feet
Average annual precipitation: 12 to 16 inches

Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal, mixed, frigid Ultic Argixerolls

Typical Pedon

A1-0 to 6 inches; brown (10YR 4/3) very stony loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine, fine, and coarse roots; common very fine and fine interstitial pores; about 15 percent stones and 5 percent cobbles; neutral (pH 6.8); clear wavy boundary.

A2-6 to 10 inches; brown (10YR 4/3) very stony loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and coarse roots; few very fine and fine tubular pores; about 50 percent stones and 5 percent pebbles; neutral (pH 6.8); clear smooth boundary.

Bt-10 to 23 inches; yellowish brown (10YR 5/4) very stony clay loam, dark yellowish brown (10YR 4/4) moist; strong fine and medium angular blocky structure; very hard, firm, sticky and plastic; few fine and medium roots; few very fine and fine tubular pores; common moderately thick clay films on faces of peds; about 25 percent stones, 5 percent cobbles, and 5 percent pebbles; neutral (pH 7.0); clear smooth boundary.

Cr-23 to 28 inches; 90 percent very pale brown (10YR 8/3) weathered bedrock and 10 percent yellowish brown (10YR 5/4) clay loam in cracks and root channels; few thin clay films on rock fragments; few fine and medium roots in cracks and along fracture planes.

R-28 inches; hard basalt.

Typical Pedon Location

Map unit in which located: Mulshoe-Gaib-Rock outcrop complex, 4 to 30 percent slopes
Location in survey area: About 3 miles south and 7 miles west of Bellevue; about 500 feet west and 500 feet south of the northeast corner of sec. 33, T. 1 N., R. 17 E.

Range in Characteristics

Depth to bedrock: 20 to 40 inches
Thickness of mollic epipedon: 7 to 14 inches
Average annual soil temperature: 42 to 46 degrees F
Base saturation. 50 to 75 percent
Other characteristics: Cr horizon absent in some pedons

A horizon:
Value-3 to 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Content of rock fragments-35 to 60 percent
Reaction-slightly acid or neutral

Bt horizon:
Hue-7.5YR or 10YR
Value-3 to 5 dry, 3 or 4 moist
Chroma-3 or 4 dry, 2 to 4 moist
Texture-very stony clay loam, very cobbly clay loam, or very gravelly clay loam
Content of rock fragments-35 to 60 percent
Content of clay-28 to 35 percent

Pagari Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Basalt plains
Parent material: Eolian-influenced alluvium over basalt
Slope: 2 to 15 percent
Elevation: 4,600 to 4,800 feet
Average annual precipitation: 10 to 12 inches
Average annual air temperature: 46 to 50 degrees F
Frost-free period: 100 to 120 days
Taxonomic class: Loamy-skeletal, mixed, mesic Aridic Calcic Argixerolls

Typical Pedon

A1-0 to 3 inches; grayish brown (10YR 5/2) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium and coarse roots; many very fine and fine interstitial pores; about 10 percent stones, 40 percent cobbles, and 5 percent pebbles; neutral (pH 7.0); clear wavy boundary.

A2-3 to 11 inches; brown (10YR 5/3) very cobbly sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium and coarse roots; common very fine and fine tubular pores; about 10 percent stones, 40 percent cobbles, and 5 percent pebbles; neutral (pH 7.0); gradual wavy boundary.

AB-11 to 17 inches; brown (10YR 5/3) very cobbly sandy loam, dark brown (10YR 3/3) moist; weak

fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; common very fine and fine tubular pores; about 10 percent stones, 40 percent cobbles, and 5 percent pebbles; neutral (pH 7.2); clear wavy boundary.

Bt-17 to 31 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, fine, and medium roots; common very fine and fine tubular pores; few thin clay films on faces of peds, lining pores, and bridging sand grains; about 10 percent stones, 40 percent cobbles, and 10 percent pebbles; neutral (pH 7.2); clear wavy boundary.

Bk1-31 to 36 inches; pale brown (10YR 6/3) extremely cobbly loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; about 10 percent stones, 40 percent cobbles, and 15 percent pebbles; slightly effervescent (about 10 percent lime); mildly alkaline (pH 7.4); clear wavy boundary.

Bk2-36 to 46 inches; very pale brown (10YR 7/3) extremely cobbly loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; many *very* fine and fine interstitial pores; about 10 percent stones, 40 percent cobbles, and 15 percent pebbles; violently effervescent (about 20 percent lime); mildly alkaline (pH 7.6); abrupt irregular boundary.

2R-46 inches; fractured basalt.

Typical Pedon Location

Map unit in which located: Pagari-Rehfield complex, 2 to 15 percent slopes

Location in survey area: About 9 miles east and 2 miles south of Carey; about 1,250 feet east and 100 feet north of the southwest corner of sec. 12, T. 2 S., R. 22 E.

Range in Characteristics

Depth to bedrock: 40 to 60 inches

Thickness of mollic epipedon: 10 to 17 inches

Average annual soil temperature: 47 to 52 degrees F

Reaction: Neutral or mildly alkaline

Depth to secondary carbonates: 24 to 36 inches

Other characteristics: AB horizon absent in some pedons

A horizon:
- Value-4 or 5 dry, 3 or 4 moist
- Chroma-2 to 4 dry or moist
- Content of clay-10 to 15 percent
- Content of rock fragments-35 to 60 percent

AB horizon:
- Value-4 or 5 dry, 3 or 4 moist
- Chroma-2 to 4 dry or moist
- Texture-very cobbly sandy loam or very cobbly loam
- Content of rock fragments-35 to 60 percent
- Content of rock fragments larger than 3 inches-25 to 50 percent
- Content of clay-10 to 17 percent

Bt horizon:
- Value-5 or 6 dry, 3 or 4 moist
- Chroma-3 or 4 dry or moist
- Texture-extremely cobbly loam, extremely cobbly sandy clay loam, or extremely cobbly clay loam
- Content of rock fragments-60 to 75 percent
- Content of rock fragments larger than 3 inches-35 to 60 percent
- Content of clay-18 to 30 percent

Bk horizon:
- Value-5 to 7 dry, 4 to 6 moist
- Chroma-3 or 4 dry or moist
- Texture-extremely cobbly sandy loam, extremely cobbly sandy clay loam, or extremely cobbly loam
- Content of rock fragments-60 to 75 percent
- Content of rock fragments larger than 3 inches-35 to 60 percent
- Content of clay-14 to 25 percent
- Content of lime-5 to 30 percent

Pedleford Series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderate

Position on landscape: Basalt plains, sides of buttes

Parent material: Alluvium derived from loess and eolian material over basalt

Slope: 2 to 30 percent

Elevation: 4,700 to 5,400 feet

Average annual precipitation: 12 to 16 inches

Average annual air temperature: 41 to 45 degrees F

Frost-free period: 60 to 90 days

Taxonomic class: Loamy-skeletal, mixed, frigid Calcic Haploxerolls

Typical Pedon

A-0 to 5 inches; dark brown (10YR 4/3) very stony loam, dark brown (10YR 3/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine interstitial pores; about 30 percent stones, 10 percent cobbles, and 5 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Bw-5 to 13 inches; brown (10YR 5/3) very stony loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; common very fine and fine tubular pores; about 30 percent stones, 10 percent cobbles, and 5 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary.

Bk1-13 to 29 inches; very pale brown (10YR 7/3) very stony silt loam, yellowish brown (10YR 5/4) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; about 30 percent stones, 20 percent cobbles, and 5 percent pebbles; moderately alkaline (pH 8.2); violently effervescent (about 20 percent lime); gradual wavy boundary.

Bk2-29 to 33 inches; very pale brown (10YR 7/3) very cobbly loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine tubular pores; about 35 percent cobbles, 15 percent stones, and 5 percent pebbles; mildly alkaline (pH 7.8); violently effervescent (about 20 percent lime); abrupt wavy boundary.

2R-33 inches; hard, lime-coated basalt.

Typical Pedon Location

Map unit in which located: McCarey-Pedleford complex, 2 to 30 percent slopes

Location in survey area: About 13 miles east of Carey; about 300 feet east and 50 feet north of the southwest corner of sec. 26, T. 1 S., R. 23 E.

Range in Characteristics

Depth to bedrock: 20 to 40 inches
Depth to calcic horizon: 13 to 20 inches
Thickness of mollic epipedon: 10 to 14 inches
Average annual soil temperature: 42 to 47 degrees F

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist

Bw horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist
Texture-very stony sandy loam, very stony loam, or very cobbly loam
Content of rock fragments-35 to 60 percent
Content of clay-13 to 19 percent
Reaction-neutral to moderately alkaline

Bk horizon:
Value-6 to 8 dry, 5 to 8 moist
Chroma-2 to 4 dry or moist
Texture-very stony silt loam, very stony loam, or very cobbly loam
Content of rock fragments-35 to 60 percent
Content of clay-10 to 16 percent
Reaction-moderately alkaline or strongly alkaline

Peevywell Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Position on landscape: Fan terraces, foot slopes, mountainsides
Parent material: Alluvium and colluvium derived from various kinds of igneous and metamorphic rock
Slope: 2 to 60 percent
Elevation: 4,700 to 6,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine, montmorillonitic, frigid Typic Durixerolls

Typical Pedon

A1-0 to 3 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable; many very fine, fine, and medium roots; many very fine interstitial pores; slightly acid (pH 6.2); clear *wavy* boundary.

A2-3 to 12 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine tubular pores; slightly acid (pH 6.4); abrupt wavy boundary.

Bt1-12 to 18 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong fine angular blocky structure; hard, firm, sticky and plastic; common very fine, fine, and medium roots;

common very fine and fine tubular pores; common moderately thick clay films on faces of peds and lining pores; neutral (pH 6.6); clear wavy boundary.

Bt2-18 to 22 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; strong fine angular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common very fine and fine tubular pores; many moderately thick clay films on faces of peds and lining pores; neutral (pH 6.6); abrupt smooth boundary.

Bt3-22 to 30 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; strong medium and coarse prismatic structure; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; about 10 percent pebbles; many prominent slickensides on faces of peds; neutral (pH 7.0); abrupt smooth boundary.

2Bq-30 to 34 inches; light brown (7.5YR 6/4) very gravelly sandy loam, strong brown (7.5YR 4/6) moist; massive; very hard, very firm; many silica laminae between rock fragments; few fine roots matted along fractures; few fine tubular pores; about 40 percent pebbles and 10 percent cobbles; weakly cemented with silica; mildly alkaline (pH 7.4); clear smooth boundary.

2Bqm-34 to 44 inches; light brown (7.5YR 6/4), indurated duripan, strong brown (7.5YR 4/6) moist; massive; few very fine tubular pores; about 40 percent pebbles and 15 percent cobbles; strongly cemented plates that have a laminar cap 1 to 4 millimeters thick; continuous silica cementation between rock fragments; mildly alkaline (pH 7.4); clear wavy boundary.

2B-44 to 61 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine interstitial pores; about 45 percent pebbles; slightly effervescent; mildly alkaline (pH 7.6).

Typical Pedon Location

Map unit in which located: Muldoon-Peevywell loams, 2 to 15 percent slopes

Location in survey area: About 3 miles west and 7 miles north of Carey; about 450 feet north and 50 feet east of the southwest corner of sec. 18, T. 1 N., R. 20 E.

Range in Characteristics

Depth to duripan: 24 to 35 inches

Depth to bedrock: 40 to more than 60 inches

Average annual soil temperature: 42 to 46 degrees F

Thickness of mollic epipedon: 10 to 16 inches

Reaction: Slightly acid to mildly alkaline

Base saturation in upper 75 centimeters: Less than 75 percent

Other characteristics of some pedons: 2Bq horizon absent, 3B horizon present, or bedrock below a depth of 40 inches

A horizon:

Value-4 or 5 dry, 3 or 4 moist
Chroma-2 or 3 dry or moist
Content of rock fragments-0 to 25 percent

Bt horizon:

Hue-10YR, 7.5YR, or 5YR
Value-5 or 6 dry, 4 or 5 moist
Chroma-3 or 4 dry or moist
Texture-clay loam, silty clay, clay, gravelly clay loam, or gravelly clay
Content of rock fragments-5 to 25 percent
Average content of clay-35 to 55 percent

2Bq horizon:

Content of rock fragments-35 to 70 percent

2Bqm horizon:

Thickness-10 to 19 inches
Content of rock fragments-35 to 70 percent
Cementation below laminar cap-weak to strong

2B horizon:

Hue-10YR or 7.5YR
Value-6 or 7 dry, 4 or 5 moist
Chroma-3 or 4 dry or moist
Texture-very gravelly sandy loam or gravelly loamy sand

Picabo Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderate

Position on landscape: Stream terraces

Parent material: Alluvium derived from various kinds of rock

Slope: 0 to 2 percent

Elevation: 4,700 to 5,000 feet

Average annual precipitation: 12 to 16 inches

Average annual air temperature: 40 to 45 degrees F

Frost-free period: 70 to 90 days

Taxonomic class: Coarse-silty, carbonatic, frigid Aquic Calcixerolls

Typical Pedon

Ak-0 to 4 inches; grayish brown (10YR 5/2) silt loam,

dark brown (10YR 3/3) moist; weak very fine and fine granular structure; soft, *very* friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine and fine interstitial pores and few very fine tubular pores; strongly effervescent (about 44 percent lime); strongly alkaline (pH 8.8); gradual wavy boundary.

ABk-4 to 9 inches; light brownish gray (10YR 6/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak very thin and thin platy structure parting to weak very fine granular; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; many very fine and few fine interstitial pores; strongly effervescent (about 49 percent lime); strongly alkaline (pH 8.5); clear smooth boundary.

Bk1-9 to 16 inches; light brownish gray (10YR 6/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin and medium platy structure parting to weak very fine and fine granular; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots and few fine and medium roots; few very fine tubular pores and common very fine and fine interstitial pores; strongly effervescent (about 60 percent lime); moderately alkaline (pH 8.3); clear wavy boundary.

Bk2-16 to 23 inches; light gray (10YR 7/1) loam, gray (10YR 5/1) moist; weak very fine and fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine roots and few fine and medium roots; few very fine interstitial pores and common very fine and few fine tubular pores; violently effervescent (about 66 percent lime); moderately alkaline (pH 8.0); gradual wavy boundary.

Bkg1-23 to 32 inches; light gray (10YR 7/1) silt loam (laboratory texture) and silty clay loam (field texture because of the content of lime), gray (10YR 6/1) moist; weak very fine, fine, and medium subangular blocky structure; hard, friable, sticky and plastic; few very fine, fine, and medium roots; common very fine and fine tubular pores; violently effervescent (about 66 percent lime); moderately alkaline (pH 8.0); gradual wavy boundary.

Bkg2-32 to 39 inches; light gray (10YR 7/1) silt loam (laboratory texture) and silty clay loam (field texture because of the content of lime), gray (10YR 5/1) moist; weak very fine, fine, and medium subangular blocky structure; hard, friable, sticky and plastic; about 5 percent gravel-sized, irregularly shaped, lime-cemented concretions; violently effervescent (about 69 percent lime); moderately alkaline (pH 7.9); abrupt smooth boundary.

2Bkg3-39 to 51 inches; white (5Y 8/1) gravelly silt loam, light gray (5Y 7/2) moist; massive; very hard, firm, sticky and plastic; few very fine roots; common fine tubular pores; 30 percent gravel-sized, irregularly shaped, lime-cemented concretions; violently effervescent (about 77 percent lime); moderately alkaline (pH 7.9); gradual wavy boundary.

3Bkg4-51 to 53 inches; white (5Y 8/2) silt loam, light olive gray (5Y 6/2) moist; few fine faint light olive yellow (2.5Y 6/8, dry) mottles; massive; very hard, firm, sticky and plastic; few very fine roots; few fine and medium tubular pores; strongly effervescent (about 25 percent lime); moderately alkaline (pH 7.9); abrupt smooth boundary.

4BCkg-53 to 55 inches; gray (N 6/0) silt loam (laboratory texture) and silty clay loam (field texture because of the content of lime), bluish gray (5B 5/1) moist; many medium and large distinct olive yellow (2.5Y 6/6, dry) mottles; massive; hard, firm, slightly sticky and plastic; common very fine and fine tubular pores; slightly effervescent (about 10 percent lime); moderately alkaline (pH 7.9); abrupt wavy boundary.

5Cg1-55 to 61 inches; gray (2.5Y 5/0) very fine sandy loam, dark bluish gray (5B 4/1) moist; few fine and medium faint olive yellow (2.5Y 6/6, dry) mottles; massive; hard, firm, slightly sticky and slightly plastic; common very fine and fine tubular pores; moderately alkaline (pH 8.0); abrupt wavy boundary.

6Cg2-61 to 72 inches; dark gray (2.5Y 4/0) extremely gravelly loamy sand, dark bluish gray (5B 4/1) moist; single grain; loose, very friable; 55 percent pebbles and 10 percent cobbles; moderately alkaline (pH 7.9).

Typical Pedon Location

Map unit in which located: Picabo silt loam, 0 to 2 percent slopes

Location in survey area: About 2 miles south and 3/4 mile east of Gannett; about 1,100 feet west and 40 feet north of the southeast corner of sec. 14, T. 1 S., R. 19 E.

Range in Characteristics

Average annual soil temperature: 42 to 47 degrees F
Depth to lime concretions: 36 to 50 inches
Depth to water table: 24 to 48 inches

Other characteristics: Mollic epipedon with value of more than 5.5 dry and 3.5 moist in some pedons because of a high content of lime (more than 40 percent)

Ak horizon:
Hue-10YR or 2.5Y
Value-5 or 6 dry, 3 to 5 moist
Chroma-1 to 3 dry or moist
Texture-silt loam or gravelly loam
Total content of clay-10 to 18 percent
Content of carbonate clay-5 to 8 percent
Sodium adsorption ratio-25 to 40
Reaction-moderately alkaline or strongly alkaline

Bk horizon:
Hue-10YR, 2.5Y, or 5Y
Value-3 to 6 moist
Chroma-1 to 3 moist
Texture-loam or silt loam
Content of lime concretions-0 to 5 percent
Total content of clay-10 to 18 percent
Content of carbonate clay-5 to 6 percent
Sodium adsorption ratio-1 to 10
Reaction-moderately alkaline or strongly alkaline

2Bkg horizon.
Value-7 or 8 dry, 6 or 7 moist
Chroma-1 or 2 dry, 2 or 3 moist
Texture-gravelly silt loam or silt loam
Content of lime concretions-10 to 35 percent
Total content of clay-30 to 38 percent
Content of carbonate clay-24 to 26 percent

3Bkg, 4BCkg, and 5Cg horizons:
Chroma-0 to 4 dry, 1 to 4 moist
Texture-very fine sandy loam, loam, or silt loam

6Cg horizon:
Hue-5Y, 2.5Y, or 513
Value-4 or 5 dry or moist
Chroma-0 or 2 dry, 1 to 3 moist
Texture-very gravelly loamy sand, very gravelly sand, or extremely gravelly loamy sand
Content of pebbles-35 to 70 percent

Polecreek Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Very slow
Position on landscape: Foothills
Parent material: Residuum derived from basalt and andesite
Slope: 4 to 30 percent
Elevation: 4,800 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Clayey-skeletal, montmorillonitic, frigid Lithic Ultic Argixerolls

Typical Pedon

A-0 to 4 inches; dark brown (10YR 4/3) very stony loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft, *very* friable, slightly sticky and plastic; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 25 percent stones; slightly acid (pH 6.4); clear smooth boundary.

Bt1-4 to 6 inches; brown (10YR 5/3) very cobbly clay, dark brown (10YR 3/3) moist; strong fine and medium subangular blocky structure; very hard, friable, very sticky and very plastic; many very fine, fine, medium, and coarse roots; common very fine tubular pores; many thin clay films on faces of peds; about 40 percent cobbles and 10 percent pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

Bt2-6 to 13 inches; brown (7.5YR 4/4) very gravelly clay, dark brown (7.5YR 4/4) moist; strong medium and coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; common very fine, fine, medium, and coarse roots; few fine and very fine tubular pores; about 40 percent pebbles and 15 percent cobbles; many slickensides on faces of peds; slightly acid (pH 6.4); abrupt smooth boundary.

R-13 inches; fractured basalt.

Typical Pedon Location

Map unit in which located: Elkcreek-Polecreek complex, 4 to 30 percent slopes
Location in survey area: About 1 mile south and 3 miles east of Moonstone Mountain; about 50 feet south and 2,500 feet east of the northwest corner of sec. 11 , T. 1 S., R. 17 E.

Range in Characteristics

Depth to bedrock: 10 to 20 inches
Average annual soil temperature: 42 to 46 degrees F
Reaction: Slightly acid or neutral
Base saturation: 50 to 75 percent

A horizon:
Hue-7.5YR or 10YR
Value-4 or 5 dry, 2 or 3 moist

Bt horizon:
Hue-5YR or 7.5YR
Value-5 or 6 dry

Texture-very cobbly clay, very cobbly clay loam, very cobbly silty clay loam, or very gravelly clay
Content of clay-35 to 60 percent

Povey Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Mountains
Parent material: Colluvium derived from quartzitic sandstone and related rock
Slope: 15 to 60 percent
Elevation: 5,000 to 9,250 feet
Average annual precipitation: 18 to 20 inches
Average annual air temperature: 37 to 41 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Loamy-skeletal, mixed Pachic Cryoborolls

Typical Pedon

A1-0 to 8 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; about 20 percent pebbles; neutral (pH 6.6); clear wavy boundary.
A2-8 to 14 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; about 20 percent pebbles; neutral (pH 6.8); clear smooth boundary.
Bw1-14 to 21 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; about 25 percent pebbles and 10 percent cobbles; neutral (pH 6.8); gradual wavy boundary.
Bw2-21 to 35 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; about 40 percent pebbles and 15 percent cobbles; neutral (pH 6.8); gradual wavy boundary.
C-35 to 60 inches; brown (10YR 5/3) extremely cobbly loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine and very fine tubular pores; about 50 percent cobbles and 20 percent pebbles; neutral (pH 7.0); gradual wavy boundary.
2R-60 inches; hard, quartzitic sandstone.

Typical Pedon Location

Map unit in which located: Povey-Vitale association, 30 to 60 percent slopes
Location in survey area: About 3 miles west and 1 mile south of Hailey; about 2,760 feet south and 900 feet west of the northeast corner of sec. 20, T. 2 N., R. 18 E.

Range in Characteristics

Depth to bedrock: More than 40 inches
Thickness of mollic epipedon: 16 to 44 inches
Average annual soil temperature: 37 to 43 degrees F
Content of clay in control section: 10 to 20 percent
Average summer soil temperature: 54 to 59 degrees F

A horizon:
Value-2 or 3 moist
Chroma-2 or 3 dry or moist
Texture-gravelly loam or very gravelly silt loam
Content of rock fragments-15 to 40 percent

Bw horizon:
Value-3 to 5 dry
Chroma-3 or 4 dry, 1 to 4 moist
Texture-very gravelly loam, very cobbly loam, or extremely gravelly fine sandy loam
Content of rock fragments-35 to 70 percent

C horizon:
Value-3 or 4 moist
Chroma-2 to 4 dry or moist
Texture-very cobbly loam, extremely cobbly loam, or extremely cobbly sandy loam
Content of rock fragments-50 to 70 percent
Reaction-neutral or mildly alkaline

Prudy Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Mountainsides
Parent material: Mixed colluvium over calcareous quartzitic residuum

Slope: 30 to 60 percent
Elevation: 4,700 to 6,000 feet
Average annual precipitation: 16 to 20 inches
Average annual air temperature: 37 to 41 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Fine-loamy, mixed Calcic Cryoborolls

Typical Pedon

A1-0 to 3 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores and common very fine and fine tubular pores; about 5 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary.

A2-3 to 10 inches; dark brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine tubular pores; about 5 percent gravel; mildly alkaline (pH 7.6); gradual smooth boundary.

BAk-10 to 14 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many very fine and fine roots; common very fine and fine tubular pores; about 10 percent pebbles; strongly effervescent (about 20 percent lime); mildly alkaline (pH 7.8); clear smooth boundary.

Bk1-14 to 21 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; many very fine and fine roots and few medium roots; common very fine and fine tubular pores; about 10 percent pebbles; violently effervescent (about 35 percent lime); moderately alkaline (pH 8.2); gradual smooth boundary.

Bk2-21 to 25 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and plastic; common very fine, fine, and medium roots; common very fine and fine tubular pores; about 30 percent pebbles; violently effervescent (about 35 percent lime); moderately alkaline (pH 8.4); gradual wavy boundary.

Bk3-25 to 42 inches; very pale brown (10YR 7/3) gravelly loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few very fine and fine tubular pores; about 10 percent cobbles and 20 percent pebbles; violently effervescent (about 35 percent lime); strongly alkaline (pH 8.6); abrupt smooth boundary.

2Bqkm-42 to 50 inches; white (10YR 8/2), indurated duripan, very pale brown (10YR 7/4) moist; massive; few fine and medium roots matted on top of duripan; about 10 percent cobbles and 25 percent pebbles cemented in place; violently effervescent (about 35 percent lime); strongly alkaline (pH 8.6); abrupt smooth boundary.

2R-50 inches; fractured, calcareous quartzite; Bqkm horizon material in fractures.

Typical Pedon Location

Map unit in which located: Blackspot-Prudy association, 30 to 60 percent slopes
Location in survey area: About 3.5 miles south and 0.5 mile east of Gannett; about 1,400 feet south and 400 feet west of the northeast corner of sec. 26, T. 1 S., R. 19 E.

Range in Characteristics

Average annual soil temperature: 39 to 43 degrees F
Thickness of mollic epipedon: 10 to 15 inches
Depth to duripan: 40 to 48 inches
Depth to bedrock: 50 to 60 inches
Depth to secondary lime: 12 to 21 inches
Other characteristics of some pedons: 2Bqk horizon present or BAk horizon absent

A horizon:
- Value-4 or 5 dry, 2 or 3 moist
- Content of pebbles-0 to 10 percent
- Content of clay-18 to 24 percent
- Effervescence-noneffervescent or slightly effervescent
- Reaction-neutral or mildly alkaline

BAk horizon:
- Value-4 to 6 dry, 2 or 3 moist
- Chroma-2 or 3 dry or moist
- Content of pebbles-5 to 20 percent
- Content of clay-18 to 24 percent
- Effervescence-slightly effervescent to strongly effervescent
- Reaction-mildly alkaline or moderately alkaline

Bk horizon:
- Value-5 to 7 dry, 5 or 6 moist
- Chroma-3 or 4 dry or moist

Texture-loam, gravelly loam, or gravelly fine sandy loam
Content of pebbles-10 to 20 percent
Content of cobbles-0 to 10 percent
Content of clay-18 to 27 percent
Effervescence-strongly effervescent or violently effervescent
Reaction-moderately alkaline or strongly alkaline

2Bqkm horizon:
Value-7 or 8 dry, 6 or 7 moist
Chroma-2 to 4 dry or moist
Content of pebbles-20 to 30 percent
Content of cobbles-5 to 10 percent
Thickness of continuous laminar cap-1 to 3 millimeters

Rehfield Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Basalt plains
Parent material: Eolian-influenced alluvium derived from various kinds of rock
Slope: 2 to 8 percent
Elevation: 4,600 to 5,000 feet
Average annual precipitation: 11 to 13 inches
Average annual air temperature: 46 to 50 degrees F
Frost-free period: 90 to 120 days
Taxonomic class: Fine-loamy, mixed, mesic Ultic Argixerolls

Typical Pedon

A-0 to 3 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium and thick platy structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; about 5 percent pebbles; neutral (pH 6.6); clear wavy boundary.
Bw-3 to 11 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; common very fine tubular pores; about 10 percent pebbles; neutral (pH 6.8); clear wavy boundary.
Bt1-11 to 23 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, medium, and coarse roots; common fine tubular pores; about 5 percent cobbles and 5 percent pebbles; neutral (pH 7.0); clear wavy boundary.
Bt2-23 to 42 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and plastic; common very fine, fine, medium, and coarse roots; common very fine tubular pores; about 5 percent cobbles and 5 percent pebbles; neutral (pH 7.2); abrupt irregular boundary.
2C-42 to 67 inches; light yellowish brown (10YR 6/4) loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium, and coarse roots; few fine tubular pores; about 5 percent pebbles; neutral (pH 7.2).

Typical Pedon Location

Map unit in which located: Deerhorn-Rehfield-Rock outcrop complex, 2 to 15 percent slopes
Location in survey area: About 16 miles east and 5 miles south of Carey; about 3,000 feet north and 1,100 feet east of the southwest corner of sec. 17, T. 2 S., R. 24 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Thickness of mollic epipedon: 10 to 14 inches
Reaction: Slightly acid to mildly alkaline
Base saturation in upper 30 inches: 50 to 75 percent
Average annual soil temperature: 47 to 52 degrees F

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist

Bt horizon:
Hue-10YR or 7.5YR
Value-5 or 6 dry, 4 or 5 moist
Chroma-3 or 4 moist or dry
Texture-loam, sandy loam, or sandy clay loam
Content of rock fragments-0 to 10 percent
Content of clay-18 to 31 percent

2C horizon:
Chroma-3 or 4 dry or moist
Texture-gravelly loamy sand, loamy sand, or very fine sandy loam
Content of rock fragments-0 to 35 percent

Rockybar Series

Depth class: Very deep

Drainage class: Well drained
Permeability: Moderate
Position on landscape: Outwash terraces
Parent material: Glacial outwash derived from igneous and metamorphic rock
Slope: 2 to 30 percent
Elevation: 5,500 to 6,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal, mixed, frigid Mollic Haploxeralfs

Typical Pedon

A-0 to 5 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky; many very fine, fine, and medium roots; many very fine and fine interstitial pores; about 20 percent stones, 30 percent cobbles, and 15 percent pebbles; neutral (pH 6.8); clear smooth boundary.

BA-5 to 9 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; about 15 percent stones, 30 percent cobbles, and 15 percent pebbles; neutral (pH 7.0); clear smooth boundary.

Bt1-9 to 20 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; about 10 percent stones, 40 percent cobbles, and 15 percent pebbles; few thin clay films on faces of peds and lining pores; neutral (pH 7.0); gradual wavy boundary.

Bt2-20 to 31 inches; light yellowish brown (10YR 6/4) extremely cobbly clay loam, dark yellowish brown (10YR 4/4) moist; strong fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; about 10 percent stones, 40 percent cobbles, and 15 percent pebbles; few thin clay films on faces of peds, lining pores, and on rock fragments; neutral (pH 7.2); gradual wavy boundary.

BC-31 to 47 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine interstitial pores; about 10 percent stones, 40 percent cobbles, and 15 percent pebbles; neutral (pH 7.2); clear wavy boundary.

C-47 to 62 inches; yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine interstitial pores; about 10 percent stones, 35 percent cobbles, and 25 percent pebbles; slightly acid (pH 6.6).

Typical Pedon Location

Map unit in which located: Rockybar extremely cobbly loam, 2 to 30 percent slopes
Location in survey area: About 13 miles north of Carey; about 900 feet south and 2,000 feet west of the northeast corner of sec. 15, T. 2 N., R. 21 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Average annual soil temperature: 42 to 47 degrees F
Thickness of solum: 30 to 48 inches
Reaction: Slightly acid or neutral

A horizon:
Value-4 or 5 dry

BA horizon:
Value-4 or 5 dry, 3 or 4 moist
Content of rock fragments-60 to 80 percent
Content of clay-15 to 25 percent

Bt horizon:
Hue-7.5YR or 10YR Value-5 or 6 dry, 4 or 5 moist
Texture-extremely cobbly loam or extremely cobbly clay loam
Content of rock fragments-60 to 80 percent
Content of clay-25 to 33 percent

BC and C horizons:
Hue-7.5YR or 10YR
Chroma-4 to 6 dry or moist
Texture-extremely cobbly sandy loam or extremely cobbly loam
Content of rock fragments-60 to 80 percent
Content of clay-15 to 27 percent

Simonton Series

Depth class: Very deep
Drainage class: Well drained

Permeability: Moderately slow
Position on landscape: Fan terraces
Parent material: Alluvium derived from granite
Slope: 2 to 30 percent
Elevation: 4,800 to 6,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-loamy, mixed, frigid Ultic Argixerolls

Typical Pedon

A1-0 to 7 inches; brown (10YR 4/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; common very fine and fine tubular pores; neutral (pH 6.8); clear wavy boundary.

A2-7 to 11 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, medium, and coarse roots; common very fine tubular pores; neutral (pH 6.8); abrupt wavy boundary.

Bt1-11 to 25 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; extremely hard, firm, sticky and plastic; few very fine, fine, and medium roots; many very fine, fine, and medium tubular pores; common thin clay films bridging mineral grains; slightly acid (pH 6.4); gradual wavy boundary.

Bt2-25 to 43 inches; light yellowish brown (10YR 6/4) clay loam, brown (10YR 4/3) moist; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; very hard, very firm, sticky and plastic; few very fine, fine, and medium roots; many very fine and fine tubular pores; many thin clay films bridging mineral grains; neutral (pH 6.6); gradual wavy boundary.

Bt3-43 to 61 inches; light brown (7.5YR 6/4) sandy clay loam, brown (7.5YR 5/4) moist; massive; extremely hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; many very fine, fine, and medium interstitial pores; many moderately thick clay films bridging mineral grains; slightly acid (pH 6.4).

Typical Pedon Location

Map unit in which located: Simonton-Bauscher complex, 4 to 15 percent slopes

Location in survey area: About 5 miles south and 2 miles west of Hailey; about 20 feet south and 1,500 feet west of the northeast corner of sec. 6, T. 1 S., R. 18 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Average annual soil temperature: 42 to 47 degrees F
Thickness of mollic epipedon: 10 to 16 inches
Base saturation in upper 30 inches: 50 to 75 percent
Reaction: Slightly acid or neutral
Other characteristics: BC horizon present in some pedons

A horizon:
Value-2 or 3 moist
Texture-loam or silt loam

Bt horizon.
Value-4 to 6 dry, 3 to 5 moist
Texture-clay loam, sandy clay loam, or loam
Content of pebbles-0 to 10 percent
Content of clay-18 to 32 percent

Smelter Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Position on landscape: Fan terraces, foothills
Parent material: Residuum and alluvium derived from andesite, latite, and welded tuff
Slope: 4 to 30 percent
Elevation: 5,200 to 6.500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 39 to 42 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine-silty, mixed, frigid Pachic Argixerolls

Typical Pedon

A1-0 to 9 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic, many very fine and fine roots; many very fine and fine interstitial pores; about 5 percent pebbles; neutral (pH 6.6); gradual wavy boundary.

A2-9 to 18 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic;

many very fine and fine roots; few fine tubular pores; about 5 percent pebbles; neutral (pH 6.6); abrupt smooth boundary.

Bt1-18 to 26 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; strong medium and coarse prismatic structure; very hard, firm, sticky and plastic; few very fine and fine roots; few fine tubular pores; about 10 percent pebbles; continuous clay films on faces of peds and lining pores; neutral (pH 7.0); clear wavy boundary.

Bt2-26 to 35 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong medium and coarse prismatic structure; very hard, firm, sticky and plastic; few fine roots; common very fine and fine tubular pores; about 10 percent pebbles; continuous moderately thick clay films on faces of peds and lining pores; neutral (pH 7.0); clear wavy boundary.

BC-35 to 61 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine roots; common very fine and fine tubular pores; about 10 percent pebbles; neutral (pH 7.2).

Typical Pedon Location

Map unit in which located: Starhope-Peevywell-Smelter foams, 4 to 30 percent slopes

Location in survey area: About 2 miles north and 7 miles east of Bellevue; about 2,500 feet south and 100 feet east of the northwest corner of sec. 17, T. 2 N., R. 20 E.

Range in Characteristics

Depth to bedrock: More than 60 inches
Thickness of mollic epipedon: 20 to 30 inches
Average annual soil temperature: 41 to 44 degrees F
Reaction: Slightly acid or neutral
Depth to argillic horizon: 14 to 22 inches

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-2 or 3 dry or moist

Bt horizon:
Hue-10YR or 7.5YR
Value-3 to 5 dry, 2 to 4 moist
Chroma-2 to 4 dry or moist
Texture-clay loam or silty clay loam
Content of rock fragments-0 to 10 percent
Content of clay-27 to 35 percent

BC horizon:
Hue-10YR or 7.5YR
Value-6 or 7 dry, 4 to 6 moist
Chroma-2 to 4 dry or moist
Texture-clay loam, sandy clay loam, or loam
Content of rock fragments-5 to 15 percent
Content of clay-20 to 30 percent

Taxadjunct Feature

The Smelter soils in this survey area on north-facing slopes at elevations above about 6,000 feet have cryic temperatures, which are outside the range for the series. This difference, however, does not significantly affect use and management.

Starhope Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Slow
Position on landscape: Foothills, mountainsides, undulating ridgetops
Parent material: Residuum derived from andesite, latite, welded tuff, and rhyolite
Slope: 4 to 60 percent
Elevation: 5,000 to 7,500 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 39 to 42 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Fine, montmorillonitic, frigid Ultic Argixerolls

Typical Pedon

A1-0 to 4 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly plastic; many very fine and fine roots; many very fine interstitial pores; neutral (pH 6.6); abrupt wavy boundary.

A2-4 to 7 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and plastic; many very fine and fine roots; many very fine interstitial and tubular pores; slightly acid (pH 6.4); abrupt smooth boundary.

BA-7 to 10 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films on faces of peds; slightly acid (pH 6.4); abrupt smooth boundary.

Bt1-10 to 17 inches; light yellowish brown (10YR 6/4)

clay loam, dark yellowish brown (10YR 4/4) moist; weak fine angular blocky structure; very hard, very firm, sticky and plastic; few very fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; few thin bleached sand and silt grains on faces of peds; about 5 percent fine gravel; neutral (pH 6.6); clear smooth boundary.

Bt2-17 to 26 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak fine prismatic structure; very hard, very firm, sticky and plastic; few very fine roots; many slickensides on faces of peds; neutral (pH 6.8); clear wavy boundary.

Bt3-26 to 30 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; common moderately thick clay films on faces of peds and lining pores; about 10 percent cobbles; neutral (pH 6.8); abrupt wavy boundary.

R-30 inches; welded tuff.

Typical Pedon Location

Map unit in which located: Starhope-Peevywell-Smelter loams, 4 to 30 percent slopes

Location in survey area: About 1/2 mile north of Little Fishcreek Reservoir; about 900 feet south and 1,800 feet east of the northwest corner of sec. 2, T. 1 N., R. 21 E.

Range in Characteristics

Depth to bedrock: 20 to 40 inches
Thickness of mollic epipedon: 7 to 18 inches
Base saturation in upper 75 centimeters: 50 to 75 percent
Average annual soil temperature: 41 to 44 degrees F
Reaction: Slightly acid or neutral
Other characteristics: BA and Bt3 horizons absent in some pedons

A horizon.
Value-4 or 5 dry, 2 or 3 moist
Texture-loam or very cobbly clay loam

Bt horizon:
Hue-5Y, 5YR, 7.5YR, or 10YR
Value-4 to 6 dry, 3 to 5 moist
Chroma-3 or 4 dry or moist
Texture-clay loam, gravelly clay loam, or cobbly clay
Content of rock fragments-0 to 30 percent
Content of clay-35 to 50 percent

Trevino Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Basalt plains, buttes
Parent material: Eolian-influenced slope alluvium derived from various kinds of rock
Slope: 2 to 15 percent
Elevation: 4,600 to 5,000 feet
Average annual precipitation: 10 to 13 inches
Average annual air temperature: 46 to 50 degrees F
Frost-free period: 100 to 120 days
Taxonomic class: Loamy, mixed, mesic Lithic Xerollic Camborthids

Typical Pedon

A-0 to 5 inches; brown (10YR 5/3) extremely stony silt loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly plastic; common very fine, fine, medium, and coarse roots; many very fine interstitial pores; about 50 percent stones and 15 percent cobbles; slightly effervescent (about 10 percent lime); mildly alkaline (pH 7.8); clear wavy boundary.

Bw-5 to 9 inches; pale brown (10YR 6/3) extremely stony silt loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly plastic; common very fine, fine, medium, and coarse roots; common very fine and fine tubular pores; about 40 percent cobbles, 15 percent stones, and 10 percent pebbles; violently effervescent (about 25 percent lime); moderately alkaline (pH 8.4); clear wavy boundary.

Bk-9 to 12 inches; pale brown (10YR 6/3) extremely stony silt loam, brown (10YR 4/3) moist; massive; loose, very friable; few very fine, fine, and medium roots; about 30 percent cobbles, 10 percent pebbles, and 25 percent stones; violently effervescent (about 30 percent lime); moderately alkaline (pH 8.4); abrupt wavy boundary.

2R-12 inches; fractured basalt.

Typical Pedon Location

Map unit in which located: Deerhorn-Wildors-Trevino complex, 2 to 15 percent slopes

Location in survey area: About 14 miles east and 7 miles south of Carey; about 1,400 feet west and 50 feet north of the southeast corner of sec. 27, T. 2 S., R. 23 E.

Range in Characteristics

Depth to bedrock: 10 to 20 inches

Average annual soil temperature: 47 to 52 degrees F
Reaction: Neutral to moderately alkaline

A horizon:
Value-4 or 5 dry, 3 or 4 moist
Chroma-2 or 3 dry or moist
Content of rock fragments-60 to 65 percent
Content of clay-12 to 18 percent

Bw horizon:
Value-6 or 7 dry, 4 or 5 moist
Chroma-3 or 4 dry or moist
Content of rock fragments-60 to 65 percent
Content of clay-12 to 18 percent

Bk horizon:
Value-6 to 8 dry, 4 or 5 moist
Chroma-2 to 4 dry or moist
Content of rock fragments-60 to 65 percent
Content of clay-12 to 18 percent
Effervescence-strongly effervescent or violently effervescent
Content of lime-15 to 30 percent

Taxadjunct Feature

The Trevino soils in this survey area have a loamy-skeletal control section, which is outside the range for the series. This difference, however, does not significantly affect use and management.

Vitale Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Mountainsides
Parent material: Colluvium and residuum derived from quartzitic sandstone and related metasedimentary rock
Slope: 30 to 60 percent
Elevation: 5,000 to 9,000 feet
Average annual precipitation: 12 to 16 inches
Average annual air temperature: 40 to 43 degrees F
Frost-free period: 60 to 90 days
Taxonomic class: Loamy-skeletal, mixed, frigid Typic Argixerolls

Typical Pedon

A-0 to 6 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure parting to moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; many fine interstitial pores; slightly acid (pH 6.5); clear wavy boundary.
Bt1-6 to 10 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 3/3) moist; weak and moderate very fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots; many fine interstitial pores; common thin clay films on faces of peds and in some pores; mildly alkaline (pH 7.6); clear wavy boundary.
Bt2-10 to 15 inches; brown (7.5YR 5/3) very gravelly clay loam, dark brown (7.5YR 3/3) moist; weak very fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots; many fine interstitial pores; common thin clay films on faces of peds and in some pores; mildly alkaline (pH 7.6); clear wavy boundary.
Bt3-15 to 23 inches; light brownish gray (10YR 6/2) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak very fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots between rock fragments; many fine interstitial pores; clay films on rock fragments; abrupt wavy boundary.
R-23 inches; quartzitic sandstone.

Typical Pedon Location

Map unit in which located: Vitale-Povey association, 30 to 60 percent slopes
Location in survey area: About 3 miles east of Bellevue; about 50 feet north and 50 feet east of the southwest corner of sec. 28, T. 2 N., R. 19 E.

Range in Characteristics

Depth to bedrock: 20 to 40 inches
Thickness of mollic epipedon: 10 to 15 inches
Average annual soil temperature: 42 to 46 degrees F
Content of rock fragments: 35 to 60 percent
Other characteristics: Bt3 horizon absent in some pedons

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-1 to 3 dry or moist
Reaction-slightly acid or neutral

Bt horizon.
Value-3 or 4 moist
Chroma-2 to 4 dry or moist
Texture-very gravelly clay loam, very gravelly loam, or very cobbly loam
Average content of rock fragments-35 to 60 percent
Reaction-neutral or mildly alkaline

Taxadjunct Feature

The Vitale soils in this survey area at elevations above about 7,500 feet have cryic temperatures, which are outside the range for the series. This difference, however, does not significantly affect use and management.

Wildors Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderate
Position on landscape: Sides of buttes, basalt plains
Parent material: Eolian material over basalt
Slope: 2 to 15 percent
Elevation: 4,600 to 5,000 feet
Average annual precipitation: 10 to 13 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 100 to 120 days
Taxonomic class: Loamy-skeletal, mixed, mesic Orthidic Durixerolls

Typical Pedon

A-0 to 2 inches; brown (10YR 5/3) very stony sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; about 30 percent stones, 10 percent cobbles, and 10 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Bw1-2 to 9 inches; yellowish brown (10YR 5/4) very stony sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial pores; about 30 percent stones, 10 percent cobbles, and 10 percent pebbles; neutral (pH 7.2); gradual wavy boundary.

Bw2-9 to 15 inches; yellowish brown (10YR 5/4) extremely stony loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine and fine tubular pores; about 40 percent stones, 15 percent cobbles, and 10 percent pebbles; mildly alkaline (pH 7.4); abrupt wavy boundary.

Bqk-15 to 21 inches; light yellowish brown (10YR 6/4) extremely stony loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; about 10 percent weakly cemented duripan fragments; about 40 percent stones, 15 percent cobbles, and 10 percent pebbles; mildly alkaline (pH 7.8); abrupt wavy boundary.

Bqkm-21 to 24 inches; very pale brown (10YR 7/3), indurated duripan, pale brown (10YR 6/3) moist; massive; few very fine and fine roots matted on top of duripan; about 15 percent stones, 10 percent cobbles, and 10 percent pebbles; cemented plates that have a laminar cap 2 to 8 millimeters thick; continuous silica and lime cementation between rock fragments; violently effervescent (about 30 percent lime); moderately alkaline (pH 8.2); abrupt wavy boundary.

2R-24 inches; lime-coated basalt.

Typical Pedon Location

Map unit in which located: Deerhorn-Wildors complex, 2 to 8 percent slopes
Location in survey area: About 7 miles south and 15 miles east of Carey; about 300 feet east and 1,200 feet south of the northwest corner of sec. 30, T. 2 S., R. 24 E.

Range in Characteristics

Depth to bedrock: 23 to 30 inches
Depth to duripan: 21 to 28 inches
Average annual soil temperature: 47 to 52 degrees F
Thickness of mollic epipedon: 7 to 16 inches
Content of rock fragments: 35 to 65 percent
Other characteristics: Bk horizon present in some pedons

A horizon:
Value-3 to 5 dry, 2 to 3 moist
Chroma-2 or 3 dry or moist
Content of rock fragments-35 to 60 percent
Reaction-neutral or mildly alkaline

Bw horizon:
Value-3 or 5 dry
Texture-very stony sandy loam, very stony loam, or extremely stony loam
Content of rock fragments-40 to 65 percent
Content of clay-11 to 19 percent
Reaction-neutral or mildly alkaline

Bqk horizon:
Value-5 or 6 dry, 4 or 5 moist
Content of fractured pan fragments-30 to 40 percent

Distance between fractures-2 to 7 centimeters

Bqkm horizon:
Content of rock fragments-50 to 70 percent

Winridge Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Very slow
Position on landscape: Mountainsides
Parent material: Colluvium and residuum derived from andesite, latite, or welded tuff
Slope: 30 to 60 percent
Elevation: 5,000 to 7,500 feet
Average annual precipitation: 16 to 20 inches
Average annual air temperature: 37 to 41 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Fine, montmorillonitic Argic Vertic Cryoborolls

Typical Pedon

A-0 to 4 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; strong fine subangular blocky structure; soft, very friable, sticky and plastic; many very fine roots; common very fine tubular pores; about 10 percent pebbles vertical cracks 1 to 3 centimeters wide and 10 to 20 centimeters apart; slightly acid (pH 6.2); abrupt smooth boundary.

Bt1-4 to 10 inches; dark grayish brown (10YR 4/2) gravelly clay, very dark grayish brown (10YR 3/2) moist; strong fine subangular blocky structure; very hard, firm, very sticky and plastic; common very fine, fine, and medium roots; many very fine and fine tubular pores; about 15 percent pebbles and 5 percent cobbles; vertical cracks 1 to 3 centimeters wide and 10 to 20 centimeters apart; many moderately thick clay films on faces of peds; slightly acid (pH 6.4); abrupt smooth boundary.

Bt2-10 to 16 inches; brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; strong medium and coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; common very fine, fine, and medium roots; few very fine tubular pores; about 10 percent pebbles; vertical cracks 1 to 2 centimeters wide and 10 to 20 centimeters apart; continuous moderately thick clay films on faces of peds; slightly acid (pH 6.4); clear wavy boundary.

Bt3-16 to 23 inches; olive brown (2.5Y 4/4) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; many very fine tubular pores; about 5 percent fine pebbles; common thin clay films on faces of peds; slightly acid (pH 6.4); clear smooth boundary.

R-23 inches; partially weathered andesite.

Typical Pedon Location

Map unit in which located: Friedman-Elksel-Winridge complex, 30 to 60 percent slopes
Location in survey area: About 8 miles north and 1 mile west of Carey; about 1,500 feet south and 50 feet west of the northeast corner of sec. 16, T. 1 N., R. 21 E.

Range in Characteristics

Depth to bedrock: 20 to 40 inches
Thickness of mollic epipedon: 16 to 30 inches
Average annual soil temperature: 39 to 43 degrees F
Average summer soil temperature. 54 to 59 degrees F
Reaction: Slightly acid or neutral
Other characteristics: Bt3 horizon absent in some pedons

A horizon:
Value-4 or 5 dry, 3 or 4 moist
Chroma-2 or 3 dry or moist
Content of clay-27 to 35 percent

Bt1 and Bt2 horizons:
Hue-10YR or 7.5YR
Value-4 or 5 dry, 3 or 4 moist
Chroma-2 to 4 dry or moist
Texture-clay, gravelly clay, or cobbly clay
Content of rock fragments-5 to 35 percent
Content of clay-40 to 60 percent

Bt3 horizon:
Hue-10YR, 7.5YR, or 2.5Y
Value-4 to 6 dry, 4 or 5 moist
Texture-sandy clay loam, gravelly clay loam, or cobbly clay loam
Content of rock fragments-5 to 25 percent
Content of clay-27 to 40 percent

Winu Series

Depth class: Moderately deep
Drainage class: Well drained
Permeability: Moderately slow
Position on landscape: Mountainsides
Parent material: Colluvium derived from latite, andesite, and basalt
Slope: 30 to 60 percent
Elevation: 5,500 to 7,500 feet

Average annual precipitation: 16 to 20 inches
Average annual air temperature: 37 to 41 degrees F
Frost-free period: Less than 60 days
Taxonomic class: Fine-loamy, mixed Argic Pachic Cryoborolls

Typical Pedon

A1-0 to 6 inches; dark grayish brown (10YR 4/2) stony loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, very friable, slightly plastic; many very fine and fine roots; many very fine interstitial pores; about 2 percent stones and 10 percent pebbles; neutral (pH 7.0); clear wavy boundary.
A2-6 to 13 inches; dark brown (10YR 4/3) stony loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly plastic; many very fine and fine roots; common very fine and fine pores; about 10 percent stones and 10 percent pebbles; neutral (pH 7.0); abrupt wavy boundary.
Bt1-13 to 21 inches; brown (10YR 4/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, friable, slightly sticky and plastic; few very fine and fine roots; common fine and very fine tubular pores; about 15 percent pebbles and 5 percent cobbles; neutral (pH 7.3); clear wavy boundary.
Bt2-21 to 29 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark brown (10YR 3/3) moist; strong fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common fine and very fine tubular pores; about 10 percent gravel and 10 percent cobbles; neutral (pH 7.3); clear wavy boundary.
Bt3-29 to 35 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; very hard, firm, sticky and plastic; common very fine and fine tubular pores; about 20 percent gravel and 10 percent cobbles; neutral (pH 7.3); abrupt smooth boundary.
R-35 inches; basalt.

Typical Pedon Location

Map unit in which located: Winu-Gaib association, 30 to 60 percent slopes
Location in survey area: About 1 mile north of Moonstone Mountain; about 2,000 feet east and 1,500 feet south of the northwest corner of sec. 32, T. 1 N., R. 17 E.

Range in Characteristics

Depth to bedrock: 24 to 40 inches
Thickness of mollic epipedon: 16 to 30 inches
Average annual soil temperature: 39 to 43 degrees F
Average summer soil temperature: 54 to 59 degrees F

A horizon:
Value-4 or 5 dry, 2 or 3 moist
Chroma-1 to 3 dry or moist
Content of rock fragments-5 to 30 percent

Bt horizon:
Texture-gravelly loam or gravelly clay loam
Content of rock fragments-15 to 30 percent
Content of clay-20 to 30 percent
Reaction-slightly acid or neutral

Yutrue Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Very slow
Position on landscape: Basalt plains
Parent material: Fine-textured alluvium derived from various kinds of rock
Slope: 0 to 12 percent
Elevation: 4,600 to 4,800 feet
Average annual precipitation: 11 to 16 inches
Average annual air temperature: 45 to 50 degrees F
Frost-free period: 100 to 120 days
Taxonomic class: Fine, montmorillonitic, mesic Vertic Xerochrepts

Typical Pedon

A-0 to 2 inches; pale brown (10YR 6/3) silty clay, brown (10YR 4/3) moist; strong very fine granular structure; soft, very friable, sticky and plastic; many very fine and fine roots; many very fine interstitial pores and few fine tubular pores; neutral (pH 7.0); gradual wavy boundary.
BA-2 to 7 inches; pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; moderate medium subangular blocky structure parting to moderate fine granular structure; slightly hard, friable, very sticky and very plastic; many very fine and fine roots; common very fine and fine tubular pores; neutral (pH 7.2); abrupt wavy boundary.
Bw1-7 to 17 inches; pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; strong medium and coarse angular blocky structure; extremely hard, extremely firm, very sticky and very plastic; common fine, medium, and coarse roots; few fine tubular pores;

common slickensides present; 0 to 5 percent pebbles; neutral (pH 7.3); gradual wavy boundary.

Bw2-17 to 26 inches; yellowish brown (10YR 5/4) silty clay, dark yellowish brown (10YR 4/4) moist; strong medium and coarse angular blocky structure; extremely hard, extremely firm, very sticky and very plastic; common fine, medium, and coarse roots; few fine tubular pores; many slickensides present; mildly alkaline (pH 7.5); clear smooth boundary.

Bw3-26 to 35 inches; pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; strong medium and coarse angular blocky structure; very hard, very firm, very sticky and very plastic; few fine, medium, and coarse roots; few fine tubular pores; common slickensides; mildly alkaline (pH 7.8); slightly effervescent (about 5 to 15 percent lime); clear wavy boundary.

Bk1-35 to 42 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; moderate medium angular blocky structure; hard, friable, sticky and very plastic; few very fine and fine roots; few fine tubular pores; moderately alkaline (pH 8.0); strongly effervescent (about 20 percent lime); clear wavy boundary.

Bk2-42 to 63 inches; white (10YR 8/1) clay loam, light gray (10YR 7/2) moist; moderate fine prismatic structure parting to strong fine and medium angular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; few fine tubular pores; moderately alkaline (pH 8.4); violently effervescent (about 35 percent lime).

Typical Pedon Location

Map unit in which located: Bostrum-Yutrue-Hamrub complex, 2 to 12 percent slopes

Location in survey area: About 8.2 miles south and 3.2 miles west of Gannett; about 1,600 feet south and 1,300 feet west of the northeast corner of sec. 19, T. 2 S., R. 19 E.

Range in Characteristics

Average annual soil temperature: 47 to 52 degrees F
Depth of vertical cracks: 50 to 60 centimeters
Width of vertical cracks: 2 to 5 millimeters

A and BA horizons.
Hue-10YR or 7.5YR
Value-5 or 6 dry
Chroma-3 or 4 dry or moist
Content of pebbles-0 to 5 percent
Content of cobbles-0 to 5 percent
Content of clay-40 to 60 percent

Bw horizon:
Hue-10YR or 7.5YR
Texture-silty clay or clay
Content of pebbles-0 to 5 percent
Content of clay-40 to 60 percent

Bk horizon:
Hue-10YR or 7.5YR
Texture-silty clay loam or clay loam
Content of pebbles-0 to 5 percent
Content of clay-35 to 40 percent

Taxadjunct Feature

The Yutrue soils in this survey area have vertical cracks that are 2 to 5 millimeters wide and extend to a depth of 50 to 60 centimeters. This feature is outside the range for the series. This difference, however, does not significantly affect use and management.

Formation of the Soils

Soil is a natural, three-dimensional body on the surface of the earth. that supports or is capable of supporting plants. It is a mixture of minerals, organic matter, water, and air, all of which occur in varying proportions. Soils differ in their appearance, productivity, and management requirements in different areas and within short distances, The characteristics of a soil are determined by the interaction of five factors: (1) the parent material; (2) the climate in which the soil material has accumulated and has existed since accumulation; (3) the relief, which influences the drainage, moisture content, and aeration of the soil, the susceptibility of the soil to erosion, and the exposure of the soil to sun and wind; (4) the biological forces, or plants and animals living on and in the soil, that act on the soil material; and (5) the length of time the climate and biological forces have acted on the soil material.

Parent Material

The soils in the survey area formed in residual, colluvial, and alluvial material, reworked lacustrine sediment, glacial outwash, and eolian material (fig. 12). These materials are derived from material that ranges in age from Palezoic (Little Wood and Milligan Formations) to Holocene (recent alluvium and lava flows) (13).

The soils on mountains and foothills formed in material derived from four major kinds of rock: (1) Palezoic quartzite, conglomerate, calcareous quartzite, and related metasedimentary rock; (2) Palezoic and Cretaceous quartz-monzonite, aplite, granodiorite, and related rock; (3) Oligocene and Miocene andesite, latite, tuff, and rhyolite; and (4) Pliocene silicic and basaltic flows.

The soils on mountains and foothills that formed in material derived dominantly from Palezoic quartzite, conglomerate, calcareous quartzite, and related metasedimentary rock exhibit varying degrees of development. They formed mainly in colluvium, colluvium over residuum, and colluvium influenced by volcanic ash.

The soils that formed in colluvium derived from quartzite or conglomerate do not contain lime, have a weakly to moderately developed profile, and are very gravelly or cobbly or extremely gravelly or cobbly. Milligan, Vitale, Povey, and Ketchum soils are examples.

The soils that formed in colluvium and in colluvium over residuum derived dominantly from calcareous quartzite are in relatively stable positions on the landscape. They are calcareous throughout. The upper part is gravelly or very gravelly, and it exhibits only slight development because of the content of lime, which must be leached before formation and translocation of clay can take place. The lower part of these soils is a duripan. Prudy and Blackspot soils are examples.

The soils that formed in tephra-influenced colluvium derived dominantly from quartzite or conglomerate are in the mountainous area adjacent to the Craters of the Moon National Monument. Because of their proximity to recent volcanic activity (occurring 750 to 2,000 years ago), substantial amounts of volcanic tephra have been incorporated into the upper part of the profile of these soils (12). The soils are characterized by a very gravelly, weakly developed profile that does not contain accumulations of lime. Bulk density is low (0.95 gram per centimeter or less) in the upper 75 centimeters of the profile. Lavacreek soils are an example.

The soils on mountains and foothills that formed mainly in colluvium derived dominantly from Palezoic and Cretaceous (Idaho Batholith Formation and related rock) quartz-monzonite, aplite, granodiorite, and related rock commonly are coarse textured (11). They typically have a dark gravelly coarse sandy loam A horizon and a moderately developed B horizon that commonly is gravelly sandy loam or gravelly loamy coarse sand and does not contain lime. These soils exhibit only moderate development, partly because the parent material is resistant to weathering. Earcree and Moonstone soils are examples.

The material derived dominantly from Oligocene and Miocene (Challis Volcanic Formation) andesite, latite,

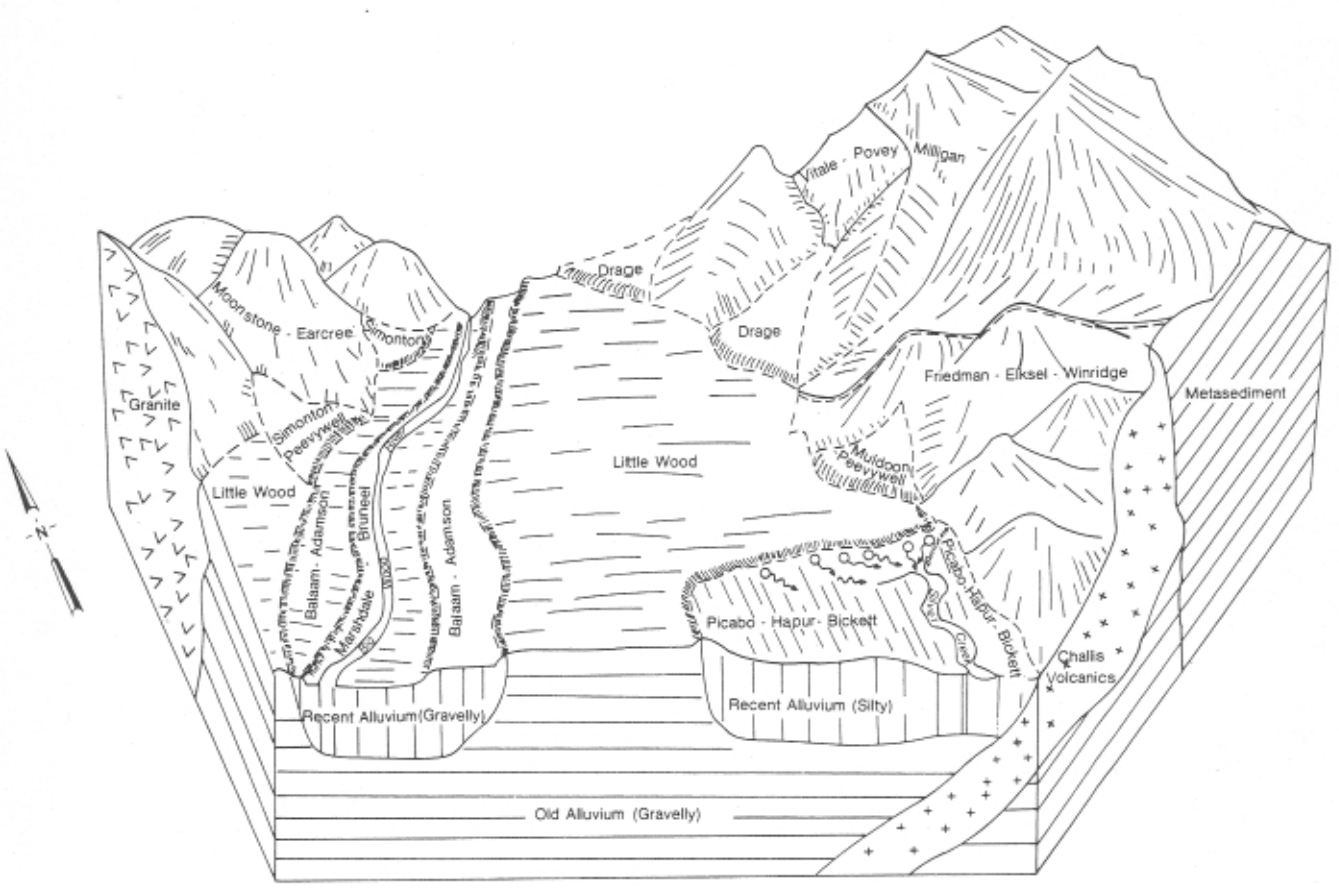

Figure 12.-Cross section of the Wood River Valley showing the pattern of soils on terraces on the valley floor and on mountains and foothills.

tuff, and rhyolite is younger than that derived from the Little Wood, Milligan, and Idaho Batholith Formations; therefore, in some areas it overlies material of the older formations. The Challis Volcanic Formation ranges in elevation from about 4,800 to 8,500 feet. The soils on mountains and foothills in areas of this formation formed mainly in colluvium, alluvium, and residuum. These soils typically do not have accumulations of lime, but they have a strongly developed profile, partly because the parent material is easily weathered. Those that formed in colluvium and alluvium have a dark loam, cobbly loam, or very cobbly loam A horizon and a cobbly clay, very cobbly clay, very gravelly clay loam, or clay loam B horizon. Elksel, Friedman, and Smelter soils are examples. Those that formed in residuum typically have a dark loam or clay loam A horizon. Starhope and Winridge soils are examples.

Other parent material that is similar to that of the Challis Volcanic Formation is Tertiary (Picabo Volcanic Formation) tuff, latite, andesite, and rhyolite. This material is in an area south of Picabo; it forms the foothills and mountains on the southern end of the Wood River Valley. The soils that formed in this material are similar to those that formed in material derived from the Challis Volcanic Formation. Friedman and Elksel soils are examples.

The rest of the soils on mountains and foothills formed in material derived dominantly from Pliocene silicic and basaltic flows (Magic Volcanic Formation). These soils are in the southwestern part of the survey area, near Moonstone Mountain. They formed in residuum, colluvium, and alluvium. Those that formed in residuum and colluvium typically do not have accumulations of lime. They have a moderately developed or strongly developed profile that includes a dark A horizon and well developed underlying horizons. Elkcreek, Winu, and Gaib soils are examples. Those that formed in alluvium typically have a dark A horizon,

have moderately developed or strongly developed underlying horizons, and commonly do not have accumulations of lime. Laurentzen soils are an example.

As a result of the volcanic activity in the survey area, many lava flows and basalt flows are spread out over much of the southern and eastern parts of the area. These flows vary in age from recent to Tertiary. The most recent lava flows are those of the Craters of the Moon Formation (12). These flows are very young and have distinct characteristics, such as the "Pahoehoe" basalt. The surface pattern resembles sequences of lava ropes oriented in the direction of the flow. This type of flow is also characterized by sinkholes, fissures, and pressure ridges. The other type of lava flow is the "Aa Aa" flow, which is characterized by a jumbled mass of broken lava, cinders, and splatter cones (10). The soils on these recent flows formed mainly in loess and volcanic tephra. They commonly are very shallow to bedrock, have a weakly developed profile, and do not have accumulations of lime. Cinderhurst soils are an example.

The Snake River Basalt Formation consists of somewhat older flows of Pleistocene age that exhibit linear etching from erosion. These flows have a thin mantle of loess and alluvium over basalt and in some areas loess over residuum derived from basalt. The soils that formed in this material have a moderately expressed profile. They are younger than the soils on foothills and mountains and have developed in a lower precipitation zone. They have a moderately expressed B horizon and commonly have accumulations of lime in the B horizon. McCarey, Pedleford, Bancroft, and McBiggam soils are examples.

A duripan has developed in some soils that are on the older flows within the Snake River Basalt Formation and are in the 11- to 13-inch precipitation zone. In this zone, leaching of soluble material, dominantly lime and silica, is limited, but the material that is leached downward forms a cemented layer, or duripan. Over time lime and silica plug the pores and voids, and this layer becomes thicker and more cemented (6). Deerhorn and Wildors are examples of soils that formed in the older flows.

In some areas distinct drainageways have developed on basalt plains, and local alluvium has accumulated. The soils in these areas receive more moisture, mainly from runoff and snowpack, than the soils on adjacent side slopes (9). This additional moisture leaches lime, bases, and silica from the soils; thus, they have a moderately expressed profile and base saturation of less than 75 percent in the upper 30 inches. Molyneux and Rehfield soils are examples.

The older late- to mid-Pleistocene basalt generally is associated with the Bellevue, Moonstone, and Macon Flat Volcanic Formations. Most of this basalt originated around volcanic vents in the vicinity of Magic Reservoir, and the flows are tipped toward the south and southwest and bounded by the mountains to the north. These areas eventually were buried by younger Snake River basalt flows and recent basalt flows. Soils that formed in these areas have a strongly developed profile. They commonly are heavy textured and have accumulations of lime. Some of these soils also have a duripan. Bostrum, Adios, Gooding, Hamrub, and Yutrue soils are examples.

Some basalt flowed to the north into the valleys of major drainageways such as the Big Wood River, the Little Wood River, and Fish Creek. These flows commonly have been scoured and eroded or buried by alluvium and glacial outwash. Most of these areas, therefore, are considered remnant basalt plains. The soils that formed in these areas have a strongly developed profile, commonly are heavy textured, and have some lime accumulation in the underlying horizons. Some also have a duripan. These soils developed in a wetter precipitation zone than the soils on flows that tip toward the south or southwest; therefore, they have a thicker A horizon.

The soils that formed on flood plains, stream terraces, fan terraces, and outwash terraces in the survey area formed in alluvium, glacial outwash, and reworked lacustrine sediment of recent to Pleistocene age. The broad valley floors along the Big Wood River, the Little Wood River, and Fish Creek have a sequence of stream terraces and outwash terraces. The outwash terraces are oldest, and they occupy the higher positions in the alluvial valley. These terraces were deposited as proglacial outwash (11).

At the same time or shortly after the proglacial outwash was deposited, successive basalt flows spread over the valley floor at the southern end of the major drainageways. These flows essentially acted as basalt dams on the drainageways, causing a buildup of lacustrine sediment in the upper part of the valley and shifting the flow of the rivers and streams across the valley in an east-west direction. This damming occurred several times, resulting in a series of stream terraces in the valleys. Most of the original glacial outwash in these areas has been reworked by water and is now considered to be alluvium. Only a few remnant outwash terraces remain. An example is the area at the

confluence of Friedman and Muldoon Creeks. The soils that formed in this glacial outwash have a moderately developed profile, are very cobbly or gravelly or extremely cobbly or gravelly throughout, and have base saturation of less than 75 percent in the upper 30 inches. They do not have accumulations of lime. Rockybar soils are an example.

The soils on flood plains formed in recent alluvium, have a high water table, and are somewhat poorly drained to very poorly drained. They exhibit weakly expressed profile development. These soils commonly have a dark A horizon and are underlain by stratified gravel, cobbles, and sand. Bruneel and Marshdale soils are examples.

The soils on the first stream terraces above the flood plains also formed in recent alluvium and are well drained to somewhat excessively drained. They also have a weakly expressed profile and are underlain by gravel, cobbles, and sand. Balaam and Adamson soils are examples.

The soils that formed on the next stream terraces have moderate profile development. These terraces: have been in place long enough for the parent rock to weather and for clay to be translocated into the B horizon. The soils on these terraces formed in gravelly and very gravelly alluvium. They are well drained and are underlain by loose sand, gravel, and cobbles. Little Wood soils are an example. Bringmee and Carey Lake soils also formed on these terraces but in less gravelly material. These soils have well expressed accumulations of clay in the profile, but they do not have accumulations of lime.

The soils on the older fan terraces typically are well developed and well drained. These soils formed in alluvium derived from material of the Challis Volcanic Formation. They have a medium to heavy textured argillic horizon and a duripan in the B horizon. The duripan in these soils typically is older than that of other soils in the survey area. It formed when the climate of the area was considerably more moist, immediately following glaciation. During this period silica in solution moved downward in the soil and over time plugged the pores and voids in the underlying layer, making it thicker and more cemented. The duripan that formed is noncalcareous because the moisture allowed the low amount of lime present to be leached deeper into the profile and because the parent material is inherently low in lime (5). Because the downward movement of the clay was restricted by the duripan, clay accumulated above the pan and an argillic horizon formed. Peevywell and Muldoon soils are examples.

Soils on the younger fan terraces formed in alluvium derived from various kinds of rock. These soils have a moderately expressed profile. They commonly have accumulations of clay in the B horizon, Molyneux, Drage, and Justesen soils are examples.

Most of the lacustrine material that accumulated upstream as a result of basalt damming the streams has been reworked by more recent alluvial activity; therefore, these areas resemble flood plains and stream terraces. A small area of this reworked lacustrine sediment is near Picabo. Soils that formed in alluvium in these areas typically are somewhat poorly drained to very poorly drained and commonly are high in content of lime and organic matter, especially in the A horizon. Picabo, Bickett, and Hapur soils are examples.

Climate

Climate has a strong influence on soil formation. Temperature and precipitation affect the weathering of rock and its constituent minerals; the illuviation and eluviation of material; the kinds and amount of vegetation; and the accumulation and decomposition of organic matter.

The climate in the survey area is characterized by warm, dry summers and cold, moist winters. Generally, as elevation increases, average annual precipitation increases and average annual temperature decreases. The warmest and driest area is in the southern part of the survey area, where elevation is lowest. This area receives about 11 to 13 inches of precipitation annually and has an average annual temperature of about 47 to 49 degrees F. The highest amount of precipitation and the coldest temperatures occur in the mountains in the northern part of the survey area. This area annually receives 12 to more than 20 inches of precipitation and has an average annual temperature of about 34 to 44 degrees.

The soils in the warmest and driest areas typically have a thin dark A horizon and have accumulations of lime in the B horizon. Because of the low precipitation, movement of water through the soil is not sufficient to leach the lime from the profile. Some of these soils have an accumulation of silica, which forms a duripan in the B horizon. Adios, Gooding, Hamrub, Deerhorn, and Wildors are examples of soils that have a duripan. Bostrum and Yutrue are examples of soils that do not have a duripan but have accumulations of clay in the B horizon. The vegetation on these soils is mainly alkali sagebrush, Wyoming big sagebrush, and bluebunch wheatgrass.

Lime in the soils in the 12- to 16-inch precipitation zone has been leached to a greater depth in the profile,

and in some areas it has been leached out completely. These soils are cooler mainly because they are at higher elevations. The additional moisture contributes to the weathering of minerals to form clay and then to translocate it. The vegetation on these soils also reflects the additional moisture and cooler temperatures. These soils support mountain big sagebrush, threetip sagebrush, basin big sagebrush, bluebunch wheatgrass, and Idaho fescue. Because of the abundance of grasses in the plant community, considerably more organic matter is produced and incorporated into the A horizon annually. The microbial activity is slowed because of the cooler temperatures, and thus the breakdown of organic matter is slowed. The combination of more organic matter being produced and less being broken down has resulted in a thicker dark A horizon in these soils than in the soils that receive less precipitation. Molyneux, Carey Lake, Smelter, Laurentzen, and Simonton soils are examples. The leaching of clay, silica, and bases has resulted in some of the soils in this higher precipitation zone having a base saturation of less than 75 percent in the upper 30 inches.

Soils in the coldest and wettest (16 to more than 20 inches of precipitation) parts of the survey area support mainly mountain big sagebrush, mountain snowberry, and Idaho fescue plant communities. These soils are similar to those in the 12- to 16-inch precipitation zone. They do not have accumulations of lime, but they commonly have an even thicker dark A horizon. Povey, Lavacreek, Earcree, Winu, and Friedman soils are examples. Some of the soils in the higher precipitation zone support an overstory of Douglas fir. Snowberry is the dominant understory plant in these areas. Because these areas support little, if any, grass, less organic matter is incorporated into the soil annually. In addition, the cold temperatures slow the microbial activity. These soils, therefore, have a thin, light-colored A horizon. Ketchum soils are an example.

Relief

The survey area is characterized by steep mountains, gently rolling to steep foothills, undulating lava flows, fan terraces, flood plains, and stream terraces. These surfaces influence soils by affecting erosion, effective precipitation, soil drainage, air drainage, and exposure to sun and wind.

Soils on steep mountains and foothills commonly vary in depth of the profile and thickness of the A horizon. Soils on north and east aspects receive less sunlight than those on south and west aspects. On north and east aspects, the soil temperatures generally are lower and the snowpack is greater. Because the soils receive moisture from the snowpack later in the growing season, they support a thick plant cover that helps to control erosion. Consequently, the soils are deeper. The lower soil temperatures inhibit the breakdown of the organic matter produced by the abundant vegetation, and thus a thick, dark A horizon forms. Povey, Earcree, Friedman, and Lavacreek are examples of soils that exhibit these characteristics. Areas of these soils are also on south and west aspects at elevations above 7,500 feet.

Soils on south and west aspects generally are shallower and have a thinner A horizon than those on north and east aspects. Direct sunlight heats and dries the soil quickly during the growing season. This speeds up the breakdown of organic matter and: limits plant growth, resulting in a thin, dark A horizon. The rate of erosion is higher because of the limited ground cover; thus, these soils are shallower. Examples are Elksel, Starhope, Vitale, and Milligan soils.

Soils on flood plains and stream terraces are very deep and nearly level. Their proximity to watercourses and springs makes them subject to flooding or to a fluctuating water table. Bickett soils, for example, have a thick layer of organic material on the surface and are gleyed in the B horizon. Hapur, Picabo, Bruneel, and Hutton soils have organic matter in the A horizon and are mottled or gleyed in the B horizon.

Soils on fan terraces are very deep and well drained. Most of these soils are on east and west aspects, but some are on south aspects. Winds often blow the snow from smooth and convex positions into drainageways and other concave positions, thus increasing the effective moisture in these areas. The soils in these areas, such as those of the Muldoon and Molyneux series, have a thick, dark A horizon because of the increased vegetation. Soils in convex positions, such as those of the Peevywell, Justesen, and Drage series, support less vegetation and have a much thinner A horizon.

Precipitation increases at higher elevations in some areas on fan terraces; thus, the soils in these areas produce more vegetation and have a darker A horizon. In addition, gently sloping soils on fan terraces receive more effective moisture than those on adjacent steep, south aspects.

Because of the way the eolian material was deposited and reworked by water, the soils on lava flows range from deep or very deep in concave positions to moderately deep, shallow, or very shallow in convex positions. Bedrock is exposed in some areas.

Cinderhurst soils are an example of very shallow soils on the most recent flows. Examples of moderately deep soils are McCarey, Pedleford, and Deerhorn soils. Rehfield soils are an example of very deep soils in concave positions.

Living Organisms

Living organisms, including plants and animals, have a significant function in soil formation. The kinds and amount of vegetation that grow on soils have a strong influence on the development of the soils.

Soils that developed at the lowest elevations in the southern part of the survey area, where average annual precipitation is about 11 to 13 inches, support limited vegetation. Alkali sagebrush, Wyoming big sagebrush, and bluebunch wheatgrass are the main plants. Because the production of vegetation is limited, the annual addition of organic matter is also limited. Consequently, these soils have a thin, dark A horizon. Deerhorn, Hamrub, Gooding, and Bostrum soils are examples.

The soils at mid elevations in the survey area formed under 12 to 16 inches of precipitation and cooler temperatures. These soils support mainly mountain big sagebrush, threetip sagebrush, bluebunch wheatgrass, and Idaho fescue. This abundance of grasses adds appreciable amounts of organic matter to the soil surface, resulting in soils that have a thicker dark A horizon. Micro-organisms are also very active in this environment, and they influence the color of the soil, its structure, and its physical appearance. Molyneux, Justesen, Smelter, Vitale, Starhope, and Bancroft soils are examples.

At the highest elevations and generally on north- and east-facing slopes, where the average annual precipitation is 16 to more than 20 inches. the soils support mainly mountain big sagebrush, snowberry, and Idaho fescue and some Douglas fir. The abundant shrubs and grasses produce a substantial amount of organic matter that annually is added to the soil and results in a thick, dark A horizon. Because of the cold temperatures, micro-organisms are not as active and their influence on the breakdown of organic matter, soil structure, and the physical appearance of soils is not so great. Earcree and Povey soils are examples.

Douglas fir and snowberry produce less organic matter; thus the soils that support mainly these plants have a lighter colored A horizon. Ketchum soils are an example.

The somewhat poorly drained to very poorly drained soils on flood plains support water-tolerant grasses, sedges, and forbs. These soils generally are very high in organic matter content because of the abundant plant growth. Hutton, Hapur, Marshdale, Picabo, and Bruneel soils are examples. This environment, in most cases, is conducive to microbial activity, which aids in the decomposition of organic matter and the incorporation of it into the upper part of the soil profile. The permanent high water table in some of the very poorly drained soils has inhibited the growth of aerobic microorganisms and little of the organic matter has been incorporated into the soils, leaving an organic mat on the soil surface. Bickett soils are an example.

Time

The length of time the landforms in the survey area have been exposed and the variability of parent material, relief, and vegetation all contribute to the wide variety of soils in the survey area; however, the different horizons in the soil profile and the degree of their development can be directly related to time.

Soils that formed in eolian material that has been reworked by water are on the oldest lava flows in the area. These soils exhibit a high degree of development. In some areas lime and silica have been leached from the upper part of the profile and have accumulated in the lower part, forming a duripan, commonly at the point of lithic contact (8). Clay also has moved down through the profile and has accumulated above the pan, forming an argillic horizon. Examples of soils that have both a duripan and an argillic horizon are those of the Gooding and Manard series. Soils that have only an argillic horizon are those of the Goodington and Yutrue series.

Soils on the younger lava flows are characterized by a calcic horizon because of the downward movement of lime in the profile and by a moderately expressed argillic horizon because of the limited movement of clay. McCarey, Pedleford, and Bancroft soils are examples.

Cinderhurst soils are an example of the youngest and least developed soils on lava flows. Little movement of clay has taken place in these soils; thus, they have only a weakly expressed argillic horizon.

Soils on the foothills and mountains are quite variable. Ketchum, Moonstone, Earcree, Milligan, and Povey soils formed in sedimentary and intrusive igneous rock on steep slopes. Because the parent material is resistant to weathering and the soil material is constantly moving downslope, these soils exhibit little development even though they are quite old. An accumulation of organic matter and a weakly expressed B horizon are the extent of the development in these soils.

An accumulation of organic matter and a medium textured argillic horizon are present in the Elkcreek, Winu, and Gaib soils on Tertiary basalt. These soils generally are the same age as Friedman, Starhope, and Elksel soils, which formed in material from the Challis Volcanic Formation and have a fine-textured argillic horizon.

A well expressed argillic horizon and duripan are present in Muldoon and Peevywell soils, which are on the oldest fan terraces. Soils on younger fan terraces do not have a duripan, but they do exhibit a well expressed argillic horizon. Examples are Justesen, Molyneux, and Carey Lake soils. Little Wood and Drage soils are on relatively young fan terraces and stream terraces, and they have a weakly expressed argillic horizon.

Some of the youngest soils in the area are on flood plains and stream terraces. Adamson, Bruneel, and Hapur soils, which formed in recent alluvium, have a weak B horizon and an accumulation of organic matter in the A horizon.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal-unit-month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Brush management. Use of mechanical, chemical, or biological methods to reduce or eliminate competition of woody vegetation to allow understory grasses and forbs to recover or to make conditions favorable for reseeding. It increases production of forage, which reduces the hazard of erosion. Brush management may improve the habitat for some species of wildlife.

Butte. An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow, very steep-sided valley with high, precipitous walls in an area of high local relief.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some

other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Cemented pan (in tables). A cemented pan is too close to the surface for the specified use.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation by use of chemicals.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

Coarse fragments. Mineral or rock particles larger than 2 millimeters in diameter.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. *Very* cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conglomerate. A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are

Loose.-Noncoherent when dry or moist; does not hold together in a mass.

Friable.-When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.-When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable. *Plastic.*-Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.-Adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.-When d*ry,* moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.-When dry, breaks into powder or individual grains under very slight pressure.

Cemented.-Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cropping system. Growing crops using a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil. Crop residue management helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.-These soils have very high and high hydraulic conductivity and low waterholding capacity. They are not suited to crop production unless irrigated.

Somewhat excessively drained.-These soils have high hydraulic conductivity and low water-holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained.- These soils have intermediate water-holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained.-These soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless artificial drainage is provided. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained.-These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained.-These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

Very poorly drained.-These soils are wet to the surface most of the time. They are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and produced by erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess salt (in tables). The soil has excess watersoluble salts that restrict the growth of most plants.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum. or true soil, from the unconsolidated parent material.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hard to pack (in tables). The soil is difficult to compact.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual.*

The major horizons of mineral soil are as follows:

O horizon.-An organic layer of fresh and decaying plant residue.

A horizon.-The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.-The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

E horizon.-The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

C horizon.-The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

R layer.-Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intermittent stream. A stream or reach of a stream that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are-

Border.-Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.-Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.-Water is applied to small, closely spaced furrows or ditches in fields of closegrowing crops or in orchards so that it flows in only one direction.

Sprinkler.-Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.-Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance-few, *common,* and *many; size-fine, medium,* and *coarse;* and contrast-faint, *distinct, and prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables-hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Observed rooting depth. Depth to which roots have been observed to penetrate.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. The application of fire to land under such conditions of weather, soil moisture, and time of day as presumably will result in the intensity of heat and spread required to accomplish specific forest management, wildlife, grazing, or fire hazard reduction purposes.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This increases the vigor and reproduction of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site class. A grouping of site indexes into 5 to 7 production capability levels. Each level can be represented by a site curve.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

Nearly level	0 to 2 percent
Gently sloping	2 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 30 percent
Steep	30 to 60 percent
Very steep	more than 60 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na+ to Ca+ + Mg++. The degrees of sodicity and their respective ratios are

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodic soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure *are-platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with *rounded tops), blocky (angular or subangular), and granular. Structureless soils are either single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Talus. Rock fragments of any size or shape, commonly coarse and angular, derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose, broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Tephra. All clastic volcanic material that is ejected from a vent during an eruption and transported through the air. It includes volcanic ash, cinders, scoria, pumice, and blocks.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel

that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.